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# MEDICINES

THEIR

# USES AND MODE OF ADMINISTRATION,

INCLUDING

A COMPLETE CONSPECTUS OF THE THREE BRITISH PHARMACOPŒIAS,
AN ACCOUNT OF ALL THE NEW REMEDIES,
AND AN APPENDIX OF FORMULÆ.

BY

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IN THE DUBLIN SCHOOL OF MEDICINE, ETC. ETC.

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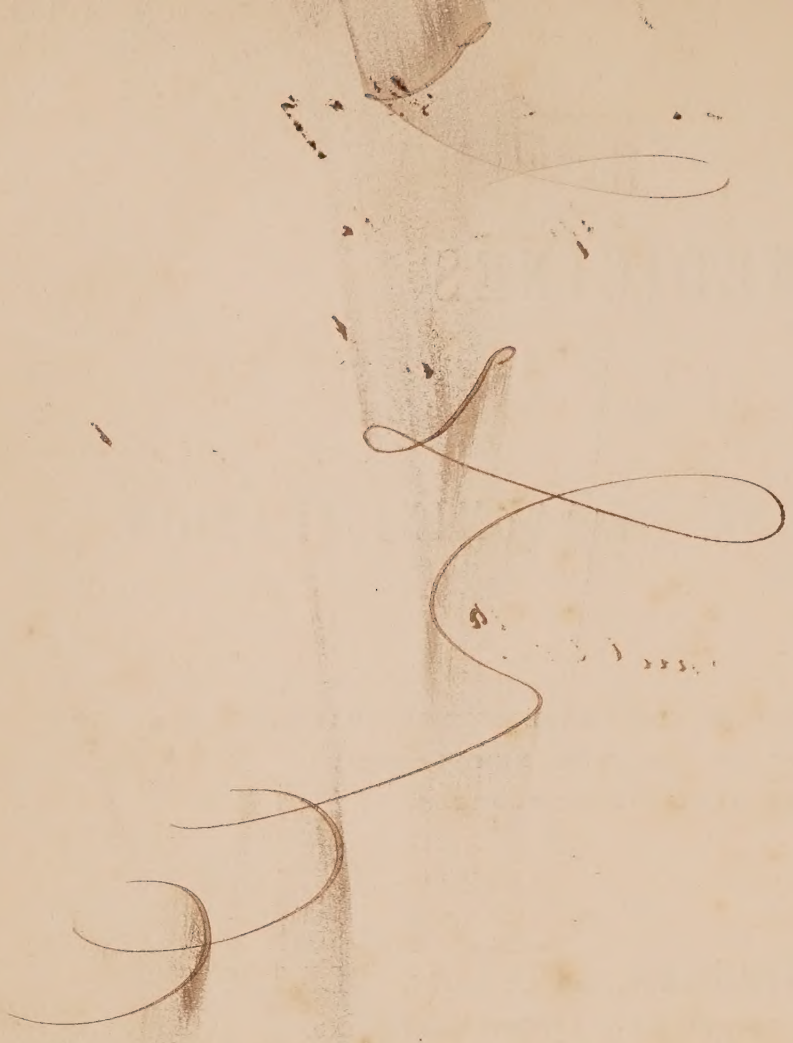

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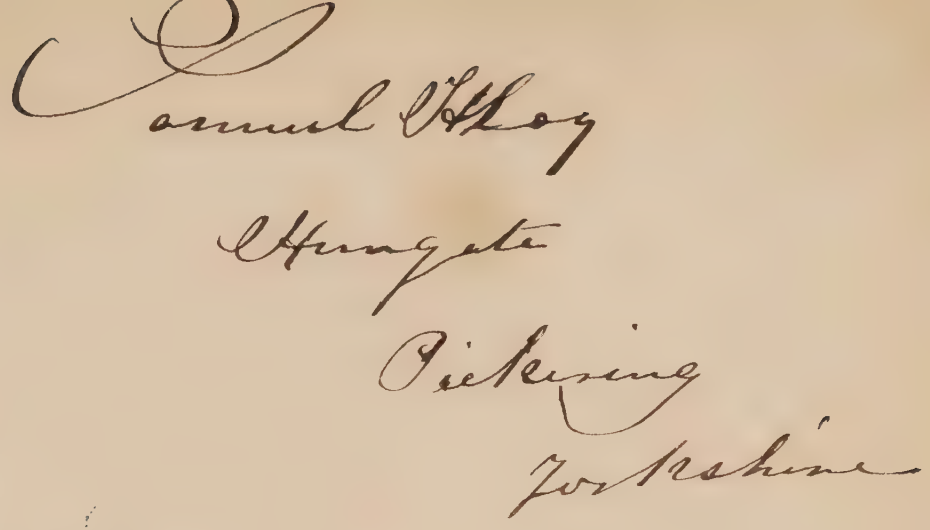

TO

ROBERT CHRISTISON, M.D. F.R.S.E.

PROFESSOR OF MATERIA MEDICA IN THE
UNIVERSITY OF EDINBURGH,

AS A TESTIMONY OF RESPECT FOR HIS TALENTS

AND OF

GRATITUDE FOR MANY FAVOURS RECEIVED,

This Volume is Dedicated

BY HIS FRIEND AND FORMER PUPIL,

THE AUTHOR.

# PREFACE.

THE very favourable reception which the First Edition of this work met with,—a large impression having been exhausted in less than three years, has induced the Author to adhere strictly to the arrangement he originally adopted.

Every new medicine or preparation, which it was conceived might prove useful to the physician, or which had been tested by experience, has been added to those previously contained in it; many of the articles have been entirely re-written; and the account of the Therapeutical Effects of individual remedies has been, in nearly every instance, considerably augmented.

Among the new medicines described, may be enumerated:—*Valerianic acid; the Valerianates of zinc, of quina, and of iron; Gallic acid; Matico; Sulphate of Manganese; Hyposulphite of soda; Acid nitrate of mercury; Oxalic acid; Chloride of carbon; Medicinal Naptha; the Arseniates of ammonia, and of quina; the Bromides of potassium, of iron, of barium, of calcium, and of mercury; Chloride of silver; Bebeerina, &c.* And of the new preparations may be mentioned:—*Carrara water; the tinctures*

*of Castor oil ; Fluid extract of senna ; Filhos' caustic ; Gondret's ammoniacal blistering ointment ; Ergotin; Digitalin ; Cetraric acid ; Amorphous Quina ; Fer réduit ; Pills of iodide of iron ; &c.*

Notwithstanding the great quantity of matter which has been added to this edition, the bulk of the volume is not much increased ; which has been effected by the use of a new fount of type, and by condensing the table of contents.

In conclusion, the author feels called on to express his thanks to the numerous medical periodicals in which the first edition of his work was so favourably reviewed ; and also to state the gratification it affords him, to think that his labours have been of some service to his professional brethren.

Leeson-street, Stephen's-green,
Dublin,
*January*, 1847.

# PREFACE

## TO THE FIRST EDITION.

THE object of the author in the following pages has been to furnish a concise view, but as complete as possible, of the different substances both simple and compound, which are deemed worthy of a place in the Materia Medica. While, therefore, sufficient attention has been bestowed on the different articles contained in the three British Pharmacopœias, an account is also given of those remedies of more recent introduction, which although not officinal, are important agents in the treatment of disease.

The difficulty, in the present state of our knowledge, of accurately classifying medicines with reference to their therapeutical properties, has deterred many recent writers from adopting a Physiological Classification of the Materia Medica; but the great practical value of an arrangement, which is based on the ultimate medicinal effects of remediate agents, has induced the author to adopt such a classification, in preference to either a natural-historical or alphabetical arrangement. In order,

however, to afford a facility of reference, the chapters themselves, and the individual articles described in each chapter, are arranged in alphabetical order.

Although the author fully admits the interest attached to the study, and the advantage derived from a knowledge, of the natural and chemical history of medicines; he has, nevertheless, thought that they might, not only with propriety, but with benefit, be omitted from a work of this character, which is intended as one of reference for the practitioner, and as an outline of Materia Medica for the student.

In describing each medicinal substance the following plan is adopted:—

1st.—The officinal appellation and English name of each article is given; and, in the case of a vegetable substance, the native country and Botanical Classification of the plant from which it is obtained. For the advantage of the student, the most important characters of each medicinal plant are also concisely described.

2nd.—The mode of preparation. Under this head the processes of the three British Pharmacopœias are given in full.

3rd.—The Physical properties.

4th.—The Chemical properties.

5th.—The adulterations, and the manner in which they may be detected.

6th.—The therapeutical effects, and the uses of the substance in the treatment of disease.

7th.—The dose and mode of administration. Under this head all the officinal preparations of the British Pharmacopœias, as well as many of those ordered by the Continental and American Colleges, are introduced.

8th.—The Incompatibles.

9th.—In the case of poisons, the antidotes and mode of treatment.

The author has added an Appendix of Formulæ, which are principally confined to the new remedies described in the work, and also an extended Posological Table.

LEESON-STREET, STEPHEN'S-GREEN,
DUBLIN.
*January*, 1844.

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# MEDICINES,

## THEIR USES

AND

## MODE OF ADMINISTRATION.

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## CHAPTER I.

### ANTACIDS.

(Alkalines—Antilithics—Lithontriptics.)

Antacids are medicines which correct acidity of the stomach and digestive organs, by combining chemically with the free acid existing there, and neutralizing it. Their action is manifestly only temporary and palliative, as they do not correct that peculiar state of the digestive organs which favours the formation of acid; their protracted use, indeed, produces a precisely similar disease of the alimentary canal; and few individuals can bear the continued use of free or carbonated alkalies, a state of general anemia usually attended with oxalic acid deposits in the urine being caused by it. Antacids should, therefore, be prescribed in combination with *vegetable tonics;* and in no case should their administration be long persisted in without occasional interruptions. One or two circumstances, relating to the particular remedy of this class which ought to be employed, require to be noticed:—Where the acid exists in the stomach in the gaseous state, ammonia and its carbonate should be preferred, as, in consequence of their volatility, a gaseous acid, which would elude the action of the fixed alkalies, will be neutralized by them. If the acidity be present in the lower bowels, as in the cœcum or colon, magnesia or lime ought to be administered, as being less likely than the other antacids to be neutralized or absorbed before they reach that portion of the intestinal canal. Where the acid exists in the urinary organs, the alkalies will be found best adapted, as they have a tendency to act more

directly on the kidneys; and where it is *lithic acid* that predominates in the urine, the preparations of potash should be preferred to those of soda, as the salt formed by the combination of the former with the acid in question is much more soluble than that formed with the latter.

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Ammoniæ causticæ aqua, D. Ammoniæ liquor, L. Ammoniæ aqua, E. *Water of caustic Ammonia; Aqueous solution of Ammonia.*

Preparation.—*Dub.* "Muriate of ammonia, in powder, 3 parts; recently-burnt lime, 2 parts; water, 10 parts; sprinkle one part of hot water on the quick-lime put into an earthen vessel and cover it; dissolve the salt in the remainder of the hot water; put the lime, when it has fallen into powder and become cool, into a retort, and add the saline liquor, when cold, to it; with a medium heat distil five parts into a refrigerated receiver." *Lond.* "Hydrochlorate of ammonia, ℥x.; lime, ℥viij.; water, Oij.; put the lime slaked with water into a retort, then add the salt broken into small pieces, and the remainder of the water; let f℥xv. distil." *Edin.* "Sal-ammoniac, ℥xiij.; quick-lime, ℥xiij.; water, f℥viiss.; distilled water, f℥xij.; slake the lime with the water; cover it up till it cools; triturate it well and quickly, with the sal-ammoniac previously in fine powder; and put the mixture into a glass retort, to which is fitted a receiver with a safety tube. Connect with the receiver a bottle also provided with a safety tube, and containing f℥iv. of the distilled water, but capable of holding twice as much. Connect this bottle with another loosely corked, and containing the remaining f℥viij. of the distilled water. The communicating tubes must descend to the bottom of the bottles at the farther end from the retort; and the bottles and receiver must be kept cool by snow, ice, or a running stream of very cold water. Apply to the retort a gradually increasing heat till gas ceases to be evolved; remove the retort, cork up the aperture in the receiver where it was connected with the retort, and apply to the receiver a gentle and gradually-increasing heat, to drive over as much of the gas in the fluid contained in it, but as little of the water as possible. Should the liquid in the last bottle not have a density of 960, reduce it with some of the strong ammonia in the first bottle, or raise it with distilled water so as to form aqua ammoniæ of the prescribed density. The strong aqua ammoniæ in the first bottle may be reduced to form the weaker solution, by diluting it with two parts and a half of water."

Physical Properties.—A colourless limpid liquid, with a pungent ammoniacal odour, and a very acrid alkaline taste. The sp. gr. varies with the strength of the preparation; that of Dublin is directed to be ·950, that of London and Edinburgh ·960.

Chemical Properties.—A solution of gaseous ammonia in water; Ammonia is composed of N. $H^3$.; or of 1 eq. of *amidogene*, and 1 of hydrogen, (Kane.) At 32° F. water may be made to absorb 780 times its volume of the gas; the solution of the Dub. Phar. contains 10·5 per cent, that of Lond. and Edin. 8·3. per cent of ammonia. It neutralizes acids with which it forms salts; gives a brown colour to litmus paper, which is only temporary; and forms dense white fumes with the vapour of muriatic acid. Exposed to the air part of the gas rapidly escapes, in consequence of its volatility, while the remainder, absorbing carbonic acid, is converted into carbonate of ammonia, which remains in solution. Cooled down to—40° a strong solution freezes into long silky needles,

and at 50° it boils; the weak solution of the pharmacopœias boils at about 150°.

*Adulterations.*—Solution of ammonia often contains carbonate of ammonia, which is known by its effervescing with acids or by lime water causing a white precipitate in it; or muriate of ammonia, which is detected by solution of nitrate of silver causing a white precipitate with it, nitric acid having been previously added to saturation. That it is of the proper strength is indicated by its being of the prescribed density. Dr. Douglas Maclagan has recently pointed out an adulteration of commercial water of ammonia with *pyrrhol*, which, he supposes, occurs from its being distilled directly from the refuse water of the gas-house. The presence of this principle renders it completely unfit for use either in medicine or pharmacy. It is readily detected by adding pure nitric acid, which produces a red colour afterwards becoming purple in water of ammonia, if any *pyrrhol* be present.

Therapeutical Effects.—Ammonia acts as a direct antacid by its neutralizing powers; it also powerfully stimulates the digestive organs. It is, therefore, to be preferred to the other remedies of this class, in cases where we wish to combine the effects of a stimulant and antacid, as in cardialgia, and flatulence arising from acidity of the stomach; but if there be any tendency to inflammation present, it should not be employed. As an antidote in poisoning with the mineral acids, it is not so valuable as the other alkalies; but in cases of poisoning with prussic acid, oil of bitter almonds, &c. it is only inferior to chlorine.

Dose and Mode of Administration.—Min. x. to min. xxx. in an ounce of water, syrup, or any bland fluid.

Incompatibles.—All acids; and the earthy and metallic salts, except those of potash, soda, lime, and baryta.

### Ammoniæ bicarbonas, D. *Bicarbonate of Ammonia.*

Preparation.—"In a proper apparatus expose any quantity of *water of carbonate of ammonia*, until the alkali is saturated, to the stream of carbonic acid gas, which escapes during the solution of white marble in dilute muriatic acid; then set it aside that crystals may be formed, which are to be dried without heat, and kept in close vessels."

Physical Properties.—This salt is usually met with in the form of an obscurely crystallized white powder, but it may be obtained in large crystals of the right rhombic prism series; it has a weak ammoniacal odour, and a saline taste.

Chemical Properties.—It is composed of 1 eq. of ammonia, 2 of carbonic acid, and 2 of water; or of 1 eq. of *amidogene*, 1 of hydrogen, 2 of carbonic acid, and 2 of water, (Kane.) It is permanent in the air; exposed to a strong heat it evaporates, leaving no residue if pure; it is soluble in eight parts of water at 60°; boiling water decomposes it, driving off part of its carbonic acid and ammonia. The solution in cold water is faintly alkaline.

Therapeutical Effects.—This preparation, though scarcely ever used in the present day, is an excellent antacid; it is free from the stimulating properties of ammonia or of its carbonate, and is also more agreeable to the taste.

Dose and Mode of Administration.—Gr. v. to gr. xxv. It may be given in *cold* aqueous vehicles, or in any of the bitter vegetable infusions.

Incompatibles.—Same as for aqua ammoniæ.

Ammoniæ carbonas, D. E.; Ammoniæ sesquicarbonas, L. *Carbonate of Ammonia; Sesquicarbonate of Ammonia.*

Preparation.—*Dub.* "Muriate of ammonia, powdered and well dried; and dried carbonate of soda, of each, one part; mix, and put them into an earthenware retort: and sublime the carbonate of ammonia with a gradually-increasing heat into a receiver kept cool." *Lond. Edin.* "Hydrochlorate of ammonia (sal ammoniac, E.), ℔j.; chalk, ℔jss.; reduce them separately to fine powder; mix, and (in a retort with a proper receiver, E.) sublime with a gradually-increasing heat."

Physical Properties.—A solid white salt, in semi-transparent fibrous cakes or fragments; with a pungent ammoniacal odour, and a caustic alkaline taste. Sp. gr. ·966.

Chemical Properties.—It consists of 3 eq. of carbonic acid, 2 of ammonia, and 2 of water; or of 1 eq. of the bicarbonate, and 1 of a simple carbonate which consists of 1 of amidogene, 1 of hydrogen, and 1 of carbonic acid, (Kane.) Exposed to the air it effloresces and soon falls to powder, carbonate of ammonia being evolved; the remaining powder is the bicarbonate. It is sublimed by heat, without any residum if it be pure. It is soluble in four parts of water at 60°, but is decomposed by boiling water and by alcohol; the solution is highly alkaline, but turmeric paper, which has been rendered brown by it, recovers its yellow colour on exposure to the air.

*Adulterations.*—If this salt contain any fixed or insoluble impurity, it will not be entirely sublimed by heat nor completely soluble in water. Sometimes owing to bad preparation, it contains muriate or sulphate of ammonia; their presence is detected, the former by nitrate of silver, the latter by muriate or nitrate of baryta, causing a white precipitate in a solution of the salt, nitric acid having been previously added to saturation.

Therapeutical Effects.—As an antacid it may be employed in the same forms of dyspepsia as the solution of ammonia; but where flatulence is present, the use of the carbonate is objectionable, owing to the carbonic acid which is set free in the stomach; its stimulant properties also contraindicate its employment where there is any tendency to inflammation. Carbonate of ammonia is administered with much advantage in the lithic acid diathesis; and it has been used, it is stated, with much benefit in diabetes.

Dose and Mode of Administration.—Gr. v. to gr. xx. in pill, or in any *cold* aqueous vehicle. Gr. xxx. produces vomiting.—*Ammoniæ carbonatis aqua*, D. E. *Liquor Ammoniæ sesquicarbonatis*, L. (Dissolve ℥iv. of carbonate (sesquicarbonate, L.) of ammonia in ℥xv. (Oj. L. E.) of distilled water, and filter. "The density of this solution is 1090," D.). A convenient strength for medicinal purposes; Dose, min. xxx. to min lx. properly diluted.

Incompatibles.—Acids; the fixed alkalies and their carbonates;

bitartrate of potash; calcareous salts; and the salts of iron, zinc, lead, and mercury; but sulphate of magnesia is not incompatible with carbonate of ammonia.

### Calcis aqua, D. E. Calcis liquor, L. *Lime Water.*

Preparation.—*Dub.* "Fresh burnt lime; and boiling water, of each one part; sprinkle the water on the lime, in an earthen vessel, covered while the lime grows hot and falls to powder; then pour over it 30 parts of cold water; cover the vessel again, and agitate the mixture repeatedly for 24 hours; then, as soon as the lime has subsided, pour off the clear liquor and keep it in well-stopped bottles." *Lond.* "Lime, ℔ss.; distilled water, Oxij.; upon the lime first slaked with a little of the water pour the remainder of the water, and shake them together; then immediately cover the vessel and set it by for three hours; afterwards keep the solution with the remaining lime in stopped glass vessels; and when it is to be used, take from the clear solution." *Edin.* "Take any convenient quantity of water; pour a little of it over about a twentieth of its weight of lime; when the lime is slaked, add it to the rest of the water in a bottle; agitate well; allow the undissolved matter to subside; pour off the clear liquor when it is wanted, replacing it with more water, and agitating briskly as before."

Physical Properties.—A transparent, colourless liquid; odourless, but having a disagreeable, alkaline taste.

Chemical Properties.—Lime is only sparingly soluble in water; requiring 778 parts at 60° and 1270 parts of boiling water for its solution, being therefore more soluble in cold than in hot water, so that a saturated solution, when boiled, deposits a hydrate of lime. Exposed to the air, lime water absorbs carbonic acid, and becomes covered with a thin crust of carbonate of lime, for medical use it must consequently be kept in well stoppered bottles. It acts faintly alkaline on vegetable colours; gives white precipitates with carbonic and oxalic acids, but does not precipitate with sulphuric acid.

Therapeutical Effects.—Lime water is a useful antacid in those forms of dyspepsia which are characterised by great irritability of the stomach, accompanied by constant secretion of acid. In America, a diet almost exclusively of lime water and milk, in the proportion of one part of the former to two or three of the latter, is found to be a very effectual plan of treatment in dyspepsia accompanied by vomiting of food. In the acidity of stomach of the gouty and rheumatic diathesis, the alkaline antacids should be preferred to lime.

Dose and Mode of Administration.—f℥i. to f℥iv. It is most conveniently administered in milk, which conceals its disagreeable taste; but as this addition would be injurious in many cases, it may be given alone. When lime water has been administered for some time, its use should be occasionally discontinued.

Incompatibles.—The vegetable and mineral acids; alkaline and metallic salts; tartar emetic; and most vegetable infusions and decoctions, as those of calumba, cinchona bark, gentian, senna, rhubarb, sarsaparilla, &c.

### Creta præparata, D. L. E. Calcis carbonas præcipitatum, D. *Prepared chalk; Precipitated carbonate of lime.*

Preparation.—*Creta præparata*, D. L. E.—"Chalk, any quantity (℔i.L.), add a little water to the chalk, and rub it to powder; put it into a large vessel with a sufficiency of water, and mix with frequent agitation; let it rest for a short time (until the coarser particles subside, D.), and pour off the supernatant liquor (still turbid, L. E.); (repeat the process, E. frequently, D.); finally; collect on a filter the fine powder that has subsided from the poured-off liquor, and dry it for use (on a bibulous stone or on paper, D.)" "Oyster shells, first freed from impurities, and washed with boiling water, are prepared in the same manner," L.—*Calcis carbonas præcipitatum*, D.—"Take of the water of muriate of lime, five parts; add three parts of carbonate of soda dissolved in four times its weight of distilled water; Wash the precipitate thrice with water by subsidence and effusion; finally collect it and dry it on a chalk-stone or on paper."

Physical Properties.—Prepared chalk is usually in small conical masses, of a dull greyish white colour, opaque, and very friable; the powder is soft and massive. It is odourless, and tasteless, but adherent to the tongue. Sp. gr. about 2·3. Precipitated carbonate of lime is a snow-white, fine powder.

Chemical Properties.—It is composed of one eq. of carbonic acid, and one of lime. It is permanent in the air; exposed to a red heat it parts with its carbonic acid, and is converted into quicklime. It is miscible with, but is not soluble in water; it dissolves in small quantity in water containing carbonic acid, from which, however, it is deposited on exposure to the air.

*Adulterations.*—Prepared chalk generally contains silica and alumina, and, from not having been sufficiently dried, moisture; these impurities are best detected by the tests of the *Edin. Pharm.*, which indicate the exact amount of pure carbonate of lime present:—"A solution of gr. xxv. in fʒx. of pyroligneous acid, when neutralized by carbonate of soda, and precipitated by gr. xxxij. of oxalate of ammonia continues precipitable after filtration by more of the test." Finely ground sulphate of lime is sometimes substituted for precipitated chalk; the fraud may be readily detected by its insolubility in dilute muriatic acid.

Therapeutical Effects.—Chalk is employed with much benefit as an antacid, in acidity of the stomach, especially when accompanied with diarrhœa, as is so frequently the case in infancy and childhood; for this purpose it is advantageously combined with aromatics, or with opium. It is also employed as an antidote in poisoning with nitric, muriatic, or oxalic acids. Precipitated carbonate of lime is not much employed in medicine, as it possesses but little advantage over prepared chalk, and is much more expensive. It is used as an ingredient in tooth powders, and for the preparation of *mercury with chalk*, and *mercury with magnesia*.

Dose and Mode of Administration.—Gr. x. to ʒij. in powder or in mixture. It has been recently proposed to administer carbonate of lime in solution in carbonic acid water, and such a preparation is ordinarily sold at present by most venders of mineral waters under the name of *Carrara water*. It is prepared by exposing ordinary lime water, under pressure, to a stream of carbonic acid-gas. The amount of bicarbonate of lime held in solution is so small, that the preparation can be regarded only in the light of a mild calcareous spring. The dose of it is from fʒij. to fʒiv. three times a day.—*Mistura Cretæ*, D. L. E.

("Prepared chalk, ℥ss.; pure sugar, ℥iij.; mucilage of gum-arabic, ℥i.; water, *by measure*, ℔j. mix;" D.—"Prepared chalk, ℥ss.; sugar, ℥iij.; mixture of acacia, f℥iss.; cinnamon water, f℥xviij.; mix;" L.—"Prepared chalk, ℥x.; pure sugar, ℥v.; mucilage, f℥iij.; spirit of cinnamon, f℥ij.; water, Oij.; triturate the chalk, sugar, and mucilage together; and then add gradually the water and spirit of cinnamon." E.) Chiefly used in diarrhœa as a vehicle for more active medicines. Dose, f℥i. to f℥ij.—*Pulvis Cretæ comp.*, D. L. E. ("Prepared chalk, ℔ss.; cinnamon, ℥iv.; tormentil root, and gum-arabic, of each, ℥iij.; long pepper, ℥ss.; rub them separately to fine powder, and then mix them," D. L.—"Prepared chalk, ℥iv.; cinnamon, in fine powder, ℥iss.; nutmeg, in fine powder, ℥i.; triturate them well together," E.) Antacid and aromatic, principally employed in the diseases of children. Dose, gr. x. to gr. xxx. —*Trochiscus Cretæ*, E.—(Prepared chalk, ℥iv.; gum arabic, ℥i.; nutmeg, ℥i.; pure sugar, ℥vi.; reduce them to powder, and beat them with a little water into a proper mass for making lozenges.) Antacid and aromatic used in acidity of the stomach; Dose, ℥i. to ℥ij.

Incompatibles.—Acids, and acidulous salts.

### Magnesia, D. L. E. *Magnesia; Calcined Magnesia.*

Preparation.—"Expose any convenient quantity of carbonate of magnesia in a crucible to a full red heat for two hours, (or till the powder, when suspended in water, presents no effervescence on the addition of muriatic acid, E.) and preserve it when cold in well-stopped glass bottles," D. E.—"Carbonate of magnesia, ℥iv. burn it for two hours in a very strong fire," L.

Physical Properties.—A very light, soft powder, perfectly white, odourless and tasteless, slightly adherent to the tongue. Sp. gr. about 2·3.

Chemical Properties.—It consists of one eq. of magnesium, and one of oxygen. Exposed to the air it absorbs carbonic acid and moisture; it is highly infusible. It is very slightly soluble in water, requiring 5142 times its weight of water at 60° for its solution; and like lime it is more soluble in cold than in hot water. It acts feebly alkaline on vegetable colours.

*Adulterations.*—Magnesia generally contains some carbonate, either from faulty preparation or bad keeping; its presence is indicated by its causing effervescence with dilute mineral acids. It is frequently adulterated with lime, silica, and alumina. If it contain silica, it will not dissolve completely in dilute muriatic acid; if alumina be present, the solution in dilute muriatic acid precipitates with excess of ammonia; and if lime be present, solution of oxalate of ammonia, or of the bicarbonate of potash, gives a white precipitate with the solution in the dilute acid.

Therapeutical Effects.—As an antacid magnesia is employed in dyspepsia, attended with acidity of the stomach and constipation; in such cases it is generally preferred to the alkalies, as being less irritant, and as the combinations which it forms with the free acids of the stomach are gently laxative. In gastrodynia and heartburn, given in combination with some aromatic, a short time before the meals, it seldom fails to

prove beneficial. It is also administered with much advantage in the acidity attendant on infantile diseases, and in persons of a gouty and rheumatic diathesis. Magnesia is also used as an antidote in poisoning with the mineral acids, but its employment in such cases is objectionable for during its combination with the acids, a degree of heat sufficient to destroy the mucous membrane of the stomach is produced.

Dose and Mode of Administration.—Gr. x. to gr. xv. twice or three times daily. It may be given suspended in milk, or in some aromatic water.

Incompatibles.—Acids; acidulous salts; metallic salts; and muriate of ammonia.

### Magnesiæ carbonas, D. L. E. *Carbonate of Magnesia.*

Preparation.—*Dub.*—"Take of sulphate of magnesia, 25 parts; carbonate of potash, 14 parts; boiling water, 400 parts; dissolve the sulphate of magnesia and carbonate of potash, each in 200 parts of water, mix together the defecated liquors; then boil the mixture for a short time, and strain it while it is hot through linen stretched in a proper manner to collect the magnesia. Wash away the sulphate of potash by repeated affusions of boiling water, and finally dry the carbonate of magnesia." *Lond. Edin.*—"Take of sulphate of magnesia, ℔iv; carbonate of soda, ℔iv. ʒviij; distilled water, cong. iv; dissolve the salts separately, each in half the water, (and strain, L.); then mix and boil the liquors, stirring constantly with a spatula for fifteen (or twenty, E.) minutes. Lastly, the liquor being poured off, wash the precipitate (collected on a filter of linen or calico, E.) with boiling distilled water and dry it."

Physical Properties.—A very white powder, light and bulky; inodorous and tasteless, varying in density, two sorts being commonly met with; the one very light, and either in very fine powder or in small cubical cakes *(light magnesia;)* the other dense, and somewhat granular *(heavy magnesia.)*

Chemical Properties.—According to Berzelius, it is a compound of hydrate of magnesia with hydrated carbonate of magnesia, consisting of 3 eq. of carbonic acid, 4 eq. of magnesia, and 4 eq. of water. It is permanent in the air; exposed to a strong red heat it parts with its water and carbonic acid, magnesia being left. It is very sparingly soluble in water, requiring 2493 parts of cold, and 9000 of hot water for its solution. But water charged with carbonic acid gas dissolves it, in the proportion of about 20 grains to the ounce. It acts, on vegetable colours, feebly alkaline.

*Adulterations.*—They are similar to those of calcined magnesia, and may be detected by the same tests.

Therapeutical Effects.—Carbonate of magnesia is employed as an antacid in the same cases as magnesia; but owing to the carbonic acid which is disengaged in the stomach when it meets with the acids naturally present in that viscus, its use is objectionable in many cases.

Dose and Mode of Administration.—Gr. xv. to ʒss.; it may be administered suspended in milk, or in some aromatic water. The most convenient form, however, for the exhibition of the carbonate of magnesia, is the solution in carbonated water, which was first introduced to the notice of the profession by Sir James Murray of this city. It is prepared by exposing distilled water, in which very pure carbonate of mag-

nesia is suspended (in the proportion of 13½ grains of the latter to every fluid ounce of the former) to a stream of carbonic acid gas forced into it by means of steam power, until a complete solution is formed. It then constitutes *Aqua Magnesiæ bicarbonatis,* and is given as an antacid in doses of f℥ss. to f℥iss. This preparation as prepared by different makers, is very liable to vary in strength, and in some instances, a solution of sulphate of soda is substituted for it. By the following simple method proposed by Mr. Redwood of London, the precise quantity of carbonate of magnesia contained in it may be readily ascertained:—Evaporate a fluid ounce of the solution to dryness in a wedge-wood dish; calcine the residue at a red heat for about five or ten minutes, in a small Berlin crucible; then weigh the calcined residue. If this residue be pure calcined magnesia, every five grains of it will be equivalent to twelve grains of the hydrated carbonate of magnesia of commerce; after weighing the calcined residue, treat it with distilled water, when, if there be any soluble salts present, they will be dissolved out and may be tested, weighed, and the amount deducted from the weight of the magnesia. —*Trochisci Magnesiæ,* E. (Carbonate of magnesia, ℥vi.; pure sugar, ℥iij.; nutmeg, ℈i.; beat them in powder, with mucilage of tragacanth, to a mass for lozenges.) In acidity of the stomach, *ad libitum.*

Incompatibles.—Acids; acidulous, and metallic salts; muriate of ammonia; and lime water.

Potassæ causticæ aqua, D. Liquor potassæ, L. Potassæ aqua, E. *Water of caustic potash; Solution of potash.*

Preparation.—*Dub.*—"Carbonate of potash, from potashes of commerce; and recently burnt lime, of each, two parts; water, 15 parts; sprinkle one part of the water made hot on the lime in an earthen vessel, and as soon as it is slaked, mix with the salt and add the remainder of the water. Put the mixture when cool into a well-stopped bottle, and agitate frequently for three days; as soon as the carbonate of lime has subsided, pour off the clear liquor, and preserve in carefully stopped green-glass bottles." *Lond.*—"Carbonate of potash, ℥xv; lime, ℥viij; boiling distilled water, cong. j; dissolve the carbonate of potash in half a gallon of the water; sprinkle a little of the water upon the lime in an earthen vessel, and the lime being slaked, add the rest of the water. The liquors being immediately mixed together in a close vessel, shake them frequently until they are cold; then set aside, that the carbonate of lime may subside. Lastly, keep the supernatant liquor when poured off, in a well-stopped green-glass bottle." *Edin.*—"Carbonate of potash (dry), ℥iv; lime, recently burned, ℥ij; water, f℥xlv; let the lime be slaked, and converted into milk of lime with f℥vij of the water; dissolve the carbonate in the rest of the water; boil the solution, and add the milk of lime in successive portions, about an eighth at a time—boiling briskly for a few minutes after each addition. Pour the whole into a deep, narrow glass vessel for 24 hours, and then withdraw with a syphon the clear liquid, which ought to amount to at least f℥xxx. and should have a density of 1·072." As solution of potash corrodes flint glass, it is directed in the pharmacopœias to be kept in green-glass bottles.

Physical Properties.—A transparent colourless liquid, with an oily appearance, and a soapy feel; it is odourless, but has an intensely acrid alkaline taste. Its specific gravity is different in the three British Pharmacopœias; that of the *Dub.* preparation is 1·080, that of the *Lond.* 1·063, and that of *Edin.* 1·072.

Chemical Properties.—A solution of potassa in water. Exposed to the air it absorbs carbonic acid rapidly, and is converted into a solution of the carbonate of potash. By heat the water is driven off, but no further change takes place. It re-acts on vegetable colours powerfully alkaline. Solution of potash converts most oils and fats into soap. It does not effervesce with acids, but combines with them, forming salts.

*Adulterations.*—Solution of potash as kept in the shops is frequently too weak, this is known by its not being of the density prescribed by the colleges. If it contain any carbonate, it will effervesce on the addition of a dilute acid, and give a white precipitate with lime water. A white precipitate caused by carbonate of soda, in the solution neutralized with dilute nitric acid, indicates the presence of lime.

Therapeutical Effects.—In dyspepsia attended with acid eructations, cardialgia, and gastrodynia, solution of potash is employed with much benefit. It not only neutralizes the free acid, but also counteracts the morbid tendency of the stomach to acid secretion. Its beneficial action is especially manifested in various forms of chronic cutaneous disease so often dependant on acidity of the digestive organs; in which cases it should be preferred to the other remedies of this class. In the acidity of the stomach of the gouty and rheumatic, and in deposits of lithic acid, or the lithates in the urine, solution of potash is also administered with much advantage. And in scrofulous affections of the testis and in many forms of external tubercular disease, the internal use of this remedy is in general productive of the best effects.

Dose and Mode of Administration.—Min. x. gradually increased to min. xl.; it should be largely diluted. Fresh table beer, or veal broth partly conceal its nauseous taste, and consequently are frequently employed as vehicles for its administration. The combination with some aromatic bitter as gentian, cascarilla, or calumba, is generally found highly beneficial.—*Brandish's alkaline solution;* (Best American pearlashes, ℔ij.; quicklime, recently burned; and wood ashes (from the ash) of each, ℔ij; boiling water, cong. vj; add first the lime, then the pearlashes, and afterwards the wood ashes to the boiling water; mix, and in 24 hours draw off the clear liquor; to every pint of which, add of oil of juniper, min. ij.) This solution has a less disagreeable taste than the officinal *aqua potassæ*, and is therefore more generally employed; it is, however, very liable to vary in strength. Dose f℥ss. to f℥ij.

Incompatibles.—Acids; acidulous and metallic salts; and the preparations of ammonia.

In cases of poisoning with solution of potash, the best antidotes are vinegar, lemon juice, and the fixed oils.

### Potassæ bicarbonas, D. L. E. *Bicarbonate of Potash.*

Preparation.—*Dub.*—"Carbonate of potash from potashes of commerce, one part; distilled water, two parts; dissolve; expose the solution in a proper apparatus to a stream of carbonic acid gas, produced by the solution of white marble in dilute muriatic acid; as soon as the liquor becomes turbid, filter, and

again expose it to the stream of gas until the alkali is saturated; set the solution aside in a cool place till crystals form, which are to be dried without heat, and kept in well closed bottles." *Lond.*—"Carbonate of potash, ℔vj; distilled water, cong. j; dissolve the carbonate of potash in the water; afterwards pass carbonic acid through the solution to saturation; apply a gentle heat, so that whatever crystals are formed may be again dissolved. Then set aside that crystals may be again produced; and the liquor being poured off, dry them. Carbonic acid is obtained from chalk rubbed to powder, and mixed with water to the consistence of a syrup, upon which sulphuric acid diluted with an equal weight of water is then poured." *Edin.*—"Carbonate of potash, ℥vj; carbonate of ammonia, ℥iiiss; triturate the carbonate of ammonia to fine powder; mix with it the carbonate of potash; triturate them thoroughly together, adding by degrees a very little water, till a smooth and uniform pulp be formed. Dry this gradually at a temperature not exceeding 140° triturating occasionally towards the close; and continue the desiccation, till a fine powder be obtained, entirely free of ammoniacal odour.

Physical Properties.—Transparent, colourless, crystals, the primary form of which is a right oblique-angled prism. It is inodorous, but has a mildly alkaline taste, without any acridity.

Chemical Properties.—It is composed of one eq. of potassa, two of carbonic acid, and one of water. It is permanent in the air; exposed to a moderate heat, part of the carbonic acid is driven off, and it is reduced to the state of carbonate. It is soluble in four parts of water at 60°, and in less than its own weight of boiling water; the solution is feebly alkaline. It is insoluble in alcohol.

*Adulterations.*—Bicarbonate of potash frequently contains carbonate of potash, from not having been sufficiently saturated with carbonic acid gas during the preparation; this is best detected by the action of corrosive sublimate on a solution in 40 parts of water, if the salt contain even a trace of the carbonate, a brick-red precipitate is produced. If any sulphates or muriates be present, a solution supersaturated with nitric acid is precipitated white, with solution of muriate or nitrate of baryta if the impurity be a sulphate, and with solution of nitrate of silver if the impurity be a muriate.

Therapeutical Effects.—Bicarbonate of potash may be administered as an antacid in the same cases as solution of caustic potash, its operation being similar; but it is not so powerful as that preparation. It possesses the advantage, however, of being less unpleasant to the taste; and its employment may be continued without interruption for a longer period.

Dose and Mode of Administration.—Gr. x. to gr. xx, two or three times a day; it may be given dissolved in some aromatic water.—*Liquor Potassæ effervescens*, L. *Potassæ aqua effervescens*, E. *Kali water.* (Bicarbonate of potash, ʒi; distilled water, Oj; dissolve the salt in the water, and pass into it carbonic acid under strong pressure, "more than sufficient for saturation; and keep the solution in a well-stopped vessel," L.) An excellent and agreeable form for the administration of this salt; Dose fʒij. to fʒviij. three times a day.

Incompatibles.—Acids; acetate and muriate of ammonia; lime water; and most of the metallic salts, but not sulphate of magnesia.

Potassæ carbonas impura, L. Lixivum cinis, D. *Impure carbonate of potash; Pearlashes; Potashes.*

Potassæ carbonas e lixivo cinere, D. Potassæ carbonas, L. E. *Carbonate of potash, prepared from potashes.*

Potassæ carbonas e tartari crystallis, D. Potassæ carbonas purum, E. *Carbonate of potash prepared from crystals of tartar; Pure carbonate of potash.*

Pearlashes or potashes are procured by lixiviation from the ashes of many trees and land plants. They are imported in large deliquescent masses of a dirty bluish-white colour, packed in barrels; and are principally brought from America, where they are prepared in very large quantity from the trees cut down in the clearing of land: purified by the process mentioned below, they are converted into pure carbonate of potash.

Preparation.—Carbonate of potash from potashes. *Dub.*—"Potashes, in coarse powder; and cold water, of each, one part; mix with trituration, and macerate for a week in an open vessel, frequently agitating; filter and evaporate to dryness in a perfectly clean silver or iron vessel; towards the end of the evaporation frequently stirring with an iron spatula; put the coarse powder thus obtained into close vessels. If the potashes be not sufficiently pure, roast them in a crucible until they become white, before they are dissolved. *Lond.*—"Impure carbonate of potash ℔ij.; distilled water, Oiss.; dissolve the impure carbonate of potash in the water, and strain; then pour it off into a proper vessel, and evaporate the water, that the liquor may thicken; then stir constantly with a spatula till the salt concretes. Carbonate of potash may be procured more pure from the crystals of bicarbonate of potash heated to redness." *Edin.*—"Obtained from the potashes of commerce by lixiviating, evaporating, and granulating, by fusion and refrigeration."—Carbonate of potash from crystals of tartar, D. "Take any quantity of crystals of tartar; heat them to redness in a silver crucible lightly covered, until they cease to emit vapours; reduce the residue to a coarse powder, and roast for two hours with frequent stirring in the same crucible uncovered; then boil it with twice its weight of water for a quarter of an hour; and after due subsidence pour off the clear liquor; let this be done three times; filter the mixed washings, and evaporate in a silver vessel; reduce the residual salt while becoming dry, by frequent stirring, to a granular form; and then heat it to an obscure red. Before it has perfectly cooled, take it from the vessel, and preserve it in well-stopped bottles." Pure carbonate of potash, E. "Most readily obtained by heating crystallized bicarbonate of potash to redness in a crucible; but more cheaply by dissolving bitartrate of potash in 30 parts of boiling water, separating and washing the crystals, which form on cooling, heating these in a loosely-covered crucible to redness, so long as fumes are discharged, breaking down the mass and roasting it in an open crucible for two hours, with occasional stirring, lixiviating the product with distilled water, filtering the solution thus obtained, evaporating the solution to dryness, granulating the salt towards the close by brisk agitation, and heating the granular salt nearly to redness. The product of either process must be kept in well closed vessels."

Physical Properties.—Carbonate of potash is met with in the form of coarse, white, crystalline grains, inodorous, with an acrid alkaline taste.

Chemical Properties.—It is composed of one eq. of potassa, and one of carbonic acid, combined with an equivalent and a half of water. It attracts moisture from the air, deliquescing rapidly and becoming

liquid. By a red heat it is fused, but is not decomposed. It is soluble in less than its own weight of water at 60°, but is insoluble in alcohol. It is highly alkaline, but not caustic.

*Adulterations.*—As commonly met with in the shops, carbonate of potash contains much water; the quantity present may be known by the loss of weight which the salt suffers when exposed to a red heat; in the *London Pharmacopœia*, it is stated, that this should not be more than 16 per cent; in the *Edinburgh*, 20 per cent. The presence of sulphates or muriates may be detected by the same tests as those given for bicarbonate of potash.

Therapeutical Effects.—As an antacid it may be employed in the same cases as the bicarbonate, but in consequence of its unpleasant taste and irritant, even poisonous, properties, it is not much used in medicine. The external application of the alkaline carbonates has recently been highly praised by Devergie, for the treatment of many obstinate diseases of the skin, particularly the various forms of papular and scaly eruptions, and the eruptive diseases of the scalp. But although he sometimes uses the carbonate of potash where the disease is very chronic, its acridity forbids its general employment, and he prefers the carbonate or bicarbonate of soda, (see page 15). In pharmacy it is employed for the preparation of caustic potash, the bicarbonate, &c.

Dose and Mode of Administration.—Gr. v. to gr. xx. largely diluted; for external use, gr. v. to gr. x. may be dissolved in f℥i of water, or made into an ointment with ℥i of prepared lard.—*Potassæ carbonatis aqua*, D.—*liquor*, L. (Carbonate of potash, (from crystals of tartar, D.), one part (℥xx. L.); distilled water, 2 parts (Oj. L.); dissolve and strain; "Sp. Gr. 1320." D.) A convenient strength for internal use; Dose, min. x. to f℥i. in milk or in some aromatic water.

Incompatibles.—Same as the bicarbonate; but sulphate of magnesia is decomposed by the carbonate. In cases of poisoning with this salt, the antidotes are the same as those for solution of potash.

## Sodæ bicarbonas, D. E. Sodæ sesquicarbonas, L. *Bicarbonate of soda; Sesquicarbonate of soda.*

Preparation.—*Dub.*—"Carbonate of soda, two parts; water, five parts; dissolve; expose the solution in a proper apparatus to the stream of carbonic acid gas procured from the solution of white marble in dilute muriatic acid, until it ceases to absorb the gas, and set it aside that crystals may form; evaporate the liquor at a temperature not above 120°, and crystallize by cooling, mix these crystals with the former, dry and preserve in a close vessel." *Edin.*—"Fill with fragments of marble a glass jar, open at the bottom, and tubulated at the top; close the bottom in such a way as to keep in the marble without preventing the free passage of a fluid; connect the tubulature closely by a bent tube and corks with an empty bottle, and this in like manner with another bottle filled with one part of carbonate of soda, and two parts of dried carbonate of soda, well triturated together; and let the tube be long enough to reach the bottom of the bottle. Before closing the last cork closely, immerse the jar to the top in diluted muriatic acid, contained in any convenient vessel; when the whole apparatus is thus filled with carbonic acid gas, secure the last cork tightly; and let the action go on till next morning, or till gas is no longer absorbed by the salt. Remove the damp salt which is formed, and dry it either

in the air without heat, or at a temperature not above 120°." SESQUICARBONATE OF SODA, *Lond.*—" Carbonate of soda, ℔vij.; distilled water, cong. j.; dissolve, and strain; then pass carbonic acid into the solution to saturation that the salt may subside; dry this, wrapped and pressed in cloth, with a gentle heat."

PHYSICAL PROPERTIES.—Usually in the form of a fine, white powder, but sometimes met with in small indistinct crystals; it is inodorous, but has a mild alkaline taste.

CHEMICAL PROPERTIES.—It is composed of one eq. of soda, two of carbonic acid, and one of water. It is permanent in the air; by a moderate heat, the water and one eq. of carbonic acid are expelled, and it is reduced to the state of carbonate. It requires 13 parts of water at 60° for its solution, but a much less quantity of boiling water; in the latter it loses one fourth of its acid, and becomes the sesquicarbonate. The solution is faintly alkaline; it effervesces with acids, but does not precipitate with the salts of magnesia.

*Adulterations.*—The only one of importance is with the simple or monocarbonate, and this is seldom wanting; it may be readily detected by the action of solution of corrosive sublimate, which gives a reddish-brown precipitate with a solution of the bicarbonate in 40 parts of distilled water, if it contain so much as a hundredth part of the carbonate.

THERAPEUTICAL EFFECTS.—In the various forms of dyspepsia attended by secretion of acid and vomiting, no remedy is so frequently employed as the bicarbonate of soda, being usually taken in solution with excess of carbonic acid. In lithiasis, and in gout and rheumatism where there is excessive secretion of uric acid and the urates, the potash preparations should be preferred to it, for the salt formed with soda and uric acid is extremely insoluble, being in fact the compound which is deposited in the joints of persons who suffer from repeated attacks of gout.

DOSE AND MODE OF ADMINISTRATION.—Gr. x. to ʒss. dissolved in water.—*Aqua carbonatis Sodæ acidula,* D. *Liquor (Aqua,* E.*) Sodæ effervescens,* L. E. (Bicarbonate (Carbonate, D.) of soda, ʒi; water (distilled, L.), *by measure* ℔j (Oj, L. E.); dissolve; and in a proper apparatus, pass into it a stream of carbonic acid gas (obtained from the solution of white marble in muriatic acid diluted with six parts of water, D,) until it is more than saturated: keep in well stopped vessels.) This constitutes *Soda water,* the form in which the bicarbonate is most generally used; as met with in the shops, however, soda water is seldom anything more than a simple solution of carbonic acid in water, not containing any carbonate of soda; this may be easily known by adding some weak acid to the solution, as soon as it has ceased to effervesce after being poured from the bottle, when no further effervescence takes place, unless the alkaline carbonate be present. Dose, fʒvj. or fʒviij, two or three times a day.—*Trochisci Sodæ bicarbonatis,* E. (Bicarbonate of soda, ʒi.; pure sugar, ʒiij.; gum-arabic, ʒss.; pulverize them; and with mucilage beat them into a proper mass for making lozenges.) In acidity of the stomach, *ad libitum.*

INCOMPATIBLES.—Acids; lime water; muriate of ammonia; and metallic salts, except those of magnesia.

SODÆ CARBONAS VENALE, *sive*, BARILLA, D. SODÆ CARBONAS IMPURA, L. *Impure carbonate of soda; Barilla.*

SODÆ CARBONAS, D. L. E. *Carbonate of soda.*

Impure carbonate of soda or barilla is obtained by burning to ashes several terrestrial plants which belong to the natural family *Chenopodiaceæ*, and which usually grow on the sea-shore. It is imported in the form of hard greyish-blue masses not deliquescent, packed in barrels. It is chiefly brought from Sicily, France, and the East Indies. It is only employed for yielding carbonate of soda by the processes mentioned below. In the present day, however, carbonate of soda is prepared on the large scale from sulphate of soda by a complicated process, the details of which will be found in all modern works on chemistry.

PREPARATION.—*Dub.*—"Barilla, reduced to powder, one part; water, two parts; boil the barilla in the water for two hours, occasionally stirring; strain the liquor, and having triturated what remains of the barilla, boil again with the same quantity of water; repeat this procedure a third time. Evaporate the filtered and mixed washings in an open iron vessel to dryness, avoiding so high a heat as might again liquefy the salt; stir with an iron spatula until the mass becomes white; then dissolve in boiling water, and evaporate the liquor to a specific gravity of 1220, and expose to the air at a temperature of about 32°, that by cooling crystals may be formed, which are to be dried and kept in a well-closed vessel. If the salt should not be sufficiently pure, repeat the solution and crystallization." *Lond.*—"Impure carbonate of soda, ℔ij.; distilled water, Oiv.; boil the salt in the water, and strain it while yet hot; lastly, set it aside that crystals may be formed." In the *Edin. Pharm.* carbonate of soda is an article of the Materia Medica.

PHYSICAL PROPERTIES.—Carbonate of soda occurs in large, transparent crystals, or fragments of crystals, the primary form of which is an oblique rhombic prism. They are inodorous; but have a disagreeable, alkaline, somewhat caustic taste. Sp. Gr. 1·623.

CHEMICAL PROPERTIES.—It is composed of one equivalent of soda, one of carbonic acid, and ten of water. It effloresces when exposed to the air; by heat it is fused in its water of crystallization, which is expelled, and a white anhydrous salt left, which again becomes liquid at a red heat, but is not decomposed. The crystals are soluble in twice their weight of water at 60°, and in their water of crystallization at 212°. The solution is powerfully alkaline.

*Adulterations.*—The impurities usually met with in carbonate of soda are sulphates and muriates; they may be detected in the manner indicated, when they are present in carbonate of potash.

THERAPEUTICAL EFFECTS.—Carbonate of soda is not employed as an antacid, so frequently as the bicarbonate, in consequence of its disagreeable taste; but is very generally used in the dried state as an alterative in the diseases of infancy and childhood. In the treatment of the eruptive diseases of the skin already referred to (page 13,) given internally, and applied externally in the forms of ointment, liniment, or lotion, its employment is productive of the best results. I have for some time used it very extensively both in hospital and in private practice in the treatment of the various forms of eczema and of impetigo of the scalp,

and have seldom seen it fail to effect a cure of these ordinarily intractable affections.

Dose and Mode of Administration.—Gr. x. to ʒss, dissolved in water; for external application from ʒi to ʒij may be dissolved in a pint of water, or an ointment prepared with from gr. x. to gr. xx. to the ounce of lard.—*Sodæ carbonas siccatum*, D. E. *Sodæ carbonas exsiccata*, L. (Heat any quantity of crystallized carbonate of soda in a proper (silver, D.) vessel, (stirring frequently, D.), till it is dry; (afterwards heat to redness, L. E.), reduce to powder, and keep in well-stopped bottles.) Thus dried, carbonate of soda may be given in the form of powder or pill; it has a very caustic taste, and therefore when given in powder, especially if to children, it should be combined with some bland substance, as tragacanth, to conceal its acrimony. Fifty-four grains of the dried carbonate of soda, are equal to 144 grains of the crystallized salt. Dose. gr. v. to gr. xx.—*Sodæ carbonatis aqua*, D. (Carbonate of soda, any quantity; dissolve it in water, so that the specific gravity of the solution may be to that of distilled water, as 1024 to 1000. A liquor of this specific gravity may be obtained by dissolving ʒi. of carbonate of soda in ℔i. *by measure*, of distilled water.) A convenient strength for internal use; Dose, fʒss. to fʒj.

Incompatibles.—Acids, and their salts; lime water; and magnesia.

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# CHAPTER II.

## ANTHELMINTICS.

(Vermifuges.)

Anthelmintics are remedies which possess the property of destroying worms, or expelling them from the intestinal canal. Besides the specific or more immediate anthelmintics, which are only described in this division, many of the more active cathartics will effect this purpose; and they should be always administered in conjunction with the specific remedies, the efficacy of which they tend much to increase. As the action of these remedies, however, is merely temporary, it will be requisite, as soon as the worms are expelled, to employ means calculated to restore the digestive organs to a healthy state, and to correct that peculiar character of them, which promotes the generation of intestinal worms. The means best calculated for this purpose are:—keeping the surface of the body warm by proper clothing, a light but nutritious diet with a moderate use of common salt, and at the same time the administration of bitter tonics with gentle aperients, and, if anemia be present, the preparations of iron.

ALLIUM SATIVUM, D. L. E. *Garlic.* A native of Italy, Sicily, and the South of France, commonly cultivated in our gardens; belonging to the class *Hexandria*, order *Monogynia* in the Linnæan arrangement, and to the Natural family *Liliaceæ*.

BOTANICAL CHARACTERS—Stem a foot and a half to three feet high, surrounded with many linear grass-like leaves, and bearing a head of many whitish flowers emerging from a membranous spatha.

PREPARATION.—The bulb is dug up for use in the month of August, cleaned and dried in the sun, and kept in bunches in a dry place.

PHYSICAL PROPERTIES.—The bulb, as it is termed, consists of several small bulbs, called cloves, grouped together within a common membranous covering, which when dry is of a dirty whitish colour, and a withered aspect; the cloves have each their proper covering, they are white and succulent, of a strong, disagreeable, peculiar odour, and an acrid, pungent taste.

CHEMICAL PROPERTIES.—Garlic consists of an acrid volatile oil, fecula, albumen, and a saccharine matter; its medical properties depend on the volatile oil, which is heavier than water, of a yellowish colour, and a very penetrating odour; it is composed of 6 atoms of carbon, 5 of hydrogen and 1 of sulphur (Wertheim).

THERAPEUTICAL EFFECTS.—Garlic, though now seldom employed as an anthelmintic in regular practice, is an excellent remedy in ascarides. Roque states that he has employed it with great success; he gives the infusion by the mouth and in clyster, and at the same time causes friction to be made with a liniment of it over the abdomen.

DOSE AND MODE OF ADMINISTRATION.—In substance, ℥ss. to ℥j. swallowed whole, or made into pills with soap; of the expressed juice, min. xx. to min. xxx. on sugar; of an infusion prepared by infusing ℥ss. of the bulb in f℥ij. of water or milk, f℥ij. to f℥iij. two or three times daily.—*Syrup of Garlic*, (Garlic, one part; boiling water, eight parts; sugar, sixteen parts;) Dose, f℥ss. to f℥j.

ARTEMISIA SANTONICA, SEMINA; D. *Worm-Seed.* The substance which is met with in the shops under this name is imported from Barbary and the Levant, and appears to be a mixture of fragments of flower-buds and their footstalks. It is incorrectly stated by the Dublin College to be the seeds of the plant above named.

PHYSICAL PROPERTIES.—The fragments are smooth, of a greenish-yellow colour; have a strong, aromatic odour, and a bitter taste.

CHEMICAL PROPERTIES.—It contains an extractive matter, to which the name of *santonine* has been applied and on which its anthelmintic properties are supposed to depend, acrid volatile oil, and other unimportant substances.

THERAPEUTICAL EFFECTS.—Not much employed in this country, though still considered a very excellent anthelmintic in several parts of the Continent. It is used in cases of ascarides and lumbrici.

DOSE AND MODE OF ADMINISTRATION.—Gr. xx. to gr. xxx. made into an electuary with honey may be given to children night and morn-

ing, followed by a brisk purge.—*Vermifuge powder*, P. (Wormseed; Corsican moss; wormwood; tansy; scordium; senna; and rhubarb, of each equal parts;) Dose, ʒss. to ʒi.—*Vermifuge bolus*, P. (Wormseed, gr. viij.; calomel, gr. ij.; camphor, gr. vj.; syrup, q. s. for one bolus). Dose, one to two daily.

Geoffroya inermis, cortex; D. Andira inermis, (Kunth). *Cabbage-tree bark.* A native of Jamaica, belonging to the Natural family *Leguminosæ (Fabaceæ*, Lindley,) and to the Linnæan class and order *Diadelphia, Decandria.*

**Botanical Characters.—A tree of considerable size, with pinnate leaves, and reddish-lilac flowers in panicles, with short pedicels.**

Physical Properties.—In rather thick fibrous pieces, of a brownish-ash colour. It has a heavy odour and a mawkish bitter taste; and is pulverulent, the powder resembling jalap.

Chemical Properties.—It contains a brownish-yellow, crystalline, very bitter, alkaline substance, which has been named *Jamaicina* and on which its medicinal properties depend, colouring matter, gum, fecula, woody fibre, &c.

Therapeutical Effects.—A powerful anthelmintic, especially in cases of the lumbrici; but in consequence of its frequently producing vomiting, hypercatharsis and even delirium, it is now seldom employed; administered with due caution, however, it is an excellent vermifuge. Brera states that he has found it peculiarly efficacious when combined with valerian.

Dose and Mode of Administration.—It should be commenced in small doses; of the powdered bark, gr. xv. to gr. xxx.—*Decoctum Geoffroyæ*, D. (The bark, bruised, ʒj.; water, *by measure* ℔ij. boil down to ℔j.; and to the strained liquor add of syrup of orange, ʒij.) Dose, for an adult, fʒss. to fʒi.; for a child, fʒss. to fʒiss. If fever, delirium, or other disagreeable effects arise from its use, warm water should be first given, then castor oil, followed by opiates.

Gigartina (Plocaria, *Nees*) helminthocorton. *Corsican Moss.* A native of the shores of the Mediterranean about Corsica. The substance known in the shops as Corsican moss consists of fragments of a great variety of Algæ; Decandolle enumerates no less than five and twenty. A small, though the most essential part of the mixture, is the plant above named.

Physical Properties.—Corsican moss as met with in commerce consists of brownish filaments mixed with broken, irregular fronds, having whitish or greenish articulations; it has a strongly saline odour and a nauseous bitter taste.

Chemical Properties.—It consists of vegetable jelly the nature of which is not well known, vegetable fibre, salts of lime and soda, a trace of iron, manganese, and silica. Its active principle is soluble in water.

THERAPEUTICAL EFFECTS.—Corsican moss has been used by the natives of Corsica for several centuries, as a remedy for intestinal worms; it appears to be useful in cases of lumbrici, particularly when occurring in young children. Bremser speaks highly of its anthelmintic properties, which he ascribes to the chloride of sodium it contains.

DOSE AND MODE OF ADMINISTRATION.—In powder, gr. x. to ʒij. made into an electuary with honey or treacle.—*Infusion of Corsican moss,* (Corsican moss, ʒiss.; boiling water, fʒiv). Dose, fʒij. to fʒss. in a cupful of water or milk.—*Jelly of Corsican moss,* P. (Corsican moss, ʒj.; sugar, ʒij.; white wine, fʒij.; isinglass, ʒss.; boil and strain). Dose, ʒj. or ʒij.

FILIX-MAS, E. ASPIDIUM, L. ASPIDIUM FILIX-MAS, D.—*The rhizome (root,* D. L.*) of Nephrodium (Aspidium,* D. L.*) filix-mas. Male Shield-fern.* Indigenous; belonging to the Linnæan class and order *Cryptogamia Filices,* and to the Natural family *Filices (Polypodiaceæ,* Lindley).

BOTANICAL CHARACTERS.—Rhizome or underground stem, large, tufted, scaly; producing in spring, beautiful fronds or leaves, pinnate, with oblong, serrated, obtuse, leaflets.

PREPARATION.—The rhizome should be dug up in summer, cleared of root-fibres, &c. but not washed, and dried quickly and thoroughly in the open air without heat, in the shade; the tufts, and those parts of the root-stock which are greenish internally, should alone be kept; they should be reduced to powder immediately, and preserved in well-stoppered bottles; the druggist's stock should be renewed annually, as in two years it loses its medical properties.

PHYSICAL PROPERTIES.—The powdered root is of a greenish-yellow colour, of a rather disagreeable odour, and has a nauseous, bitter, somewhat astringent taste.

CHEMICAL PROPERTIES.—It contains a small portion of volatile oil, on which its anthelmintic properties seem to depend; some fixed oil, fecula, uncrystallizable sugar, gum, and woody fibre.

THERAPEUTICAL EFFECTS.—The powder of the male fern-root is perhaps the most efficacious anthelmintic we possess in the treatment of tænia, and as an indigenous remedy it is especially worthy of attention. Bremser, however, in his treatise on intestinal worms, states that, "though an excellent remedy against *Bothriocephalus latus* (the tape-worm of the Swiss,) it is not so efficacious against *Tænia solium* (the tape-worm of this country.)" It acts as a poison to the worms, as in all cases, they are discharged dead.

DOSE AND MODE OF ADMINISTRATION.—Powder, ʒi. to ʒiij.; it should be given in the morning early, and followed in two hours afterwards by a brisk purge.—*Oleum Filicis-maris,* DR. PESCHIER. (The tufts of the rhizome are reduced to a moderately fine powder, exhausted with ether and the ethereal liquor distilled.) Dose, min. xx. to min. xxx. dropped on sugar, or made into an emulsion with almond mixture; half of this dose is given at bed-time, and the remainder the following morning; if it do not purge, an active cathartic should be given in the afternoon of the same day.

Mucuna, L. E. Dolichos pruriens, D.—*Cowitch, or Cowhage. The hairs from the pods of Mucuna pruriens,* L. E.—*of Dolichos pruriens,* D. This plant, Decandolle's nomenclature for which has been adopted in the London and Edinburgh pharmacopœias, is a native of the West Indian islands, belonging to the Natural family *Leguminosæ (Fabaceæ,* Lindley), and to the Linnæan class and order *Diadelphia Decandria.*

Botanical Characters.—A twining shrub, bearing purplish flowers, with a disagreeable, alliaceous odour, in axillary racemes; succeeded by coriaceous legumes, each containing three to five seeds.

Physical Properties.—The entire legumes, with the hairs attached, are usually imported; they are shaped like the letter *f,* of a brownish colour, from two to four or five inches long, thickly clothed with strong brown bristles or setæ, which, examined by the miscroscope, appear finely acuminate and serrated towards the point; these bristles separate easily and adhere obstinately to the skin, producing intolerable itching, accompanied with intense heat, and sometimes pain and swelling.

Chemical Properties.—The hairs contain tannin, according to Martius, but no acrid principle.

Therapeutical Effects.—The operation of cowitch, as an anthelmintic, seems to be completely mechanical; the minute hairs wounding and irritating the worms, thus obliging them to let go their hold on the coats of the intestine, which is protected from injury by its mucous secretion. It is chiefly serviceable in cases of ascarides and lumbrici, having but little effect on the tape-worm; indeed by many practitioners it is esteemed, and not without reason, as the best vermifuge for the lumbrici.

Dose and Mode of Administration.—The legumes are dipped in syrup, and then scraped, so as to remove the setæ; this process is repeated with fresh legumes until the syrup acquires the consistence of honey; of this a tea-spoonful is given to a child, or a table-spoonful to an adult, for three successive mornings before breakfast, and the last dose followed by a brisk purge.

Petroleum Barbadense, D. L. E. *Petroleum; Rock oil; Barbadoes tar.* A mineral production, found floating on the waters of springs and lakes in several of the West India Islands.

This substance, though still retained in the British pharmacopœias, is altogether discarded from practice. It was formerly employed in cases of tape worm, both inwardly in the forms of emulsion, and externally by friction over the abdomen.

Punica Granatum, radicis cortex, D. Granati radix, E. *Pomegranate bark; Bark of the root of Punica Granatum.*—A native of the North of Africa, introduced into the South of Europe, where it now grows freely; belonging to the Linnæan class and order *Icosandria Monogynia,* and to the Natural family *Myrtaceæ.*

Botanical Characters.—A small handsome tree growing to the height of twenty feet, with a brownish bark, and smooth leaves on short footstalks; it produces in July at the extremities of the young branches, splendid rich-scarlet flowers, which are succeeded by the orange-like fruit, crowned with the hardened persistent calyx.

Physical Properties.—Pomegranate bark is usually met with in short quills, or portions of quills, of a greyish-yellow colour externally, yellowish internally, brittle not fibrous, with a faint odour, and an astringent taste.

Chemical Properties.—According to Mitouart's analysis, it consists of tannin, wax, a sweetish substance (part of which is soluble in alcohol, and part in water, the former crystallizable, the latter having the characters of Mannite,) and free gallic acid in large quantity. Righini has recently discovered in it a peculiar acrid oleo-resinous principle, which he has named *Punicine*, and on which it is probable that its vermifuge properties depend.

*Adulterations.*—The root bark of the common barberry *(Berberis vulgaris)*, and of the box tree *(Buxus sempervivens)*, are said to be sometimes substituted for that of the pomegranate; the fraud is easily detected, as neither of these substances, although very bitter, possesses the least astringency.

Therapeutical Effects.—The bark of the root of the pomegranate is an excellent vermifuge in cases of tape-worm, and is much employed in various parts of Europe; but it is chiefly used in India, where it is said scarcely ever to fail, if properly administered; some practitioners state, that it should not be employed unless joints of the worm have already come away naturally.

Dose and Mode of Administration.—Two ounces of the bruised bark, stripped from the fresh root if possible, are macerated for twenty-four hours in two pints of water, then boiled to one-half, and filtered; this is given in three doses, with an interval of half an hour between each dose; vomiting frequently occurs after the first or second dose, but this should not prevent us from administering a third. Soon afterwards the patient passes many stools in which joints of the worm are expelled. The doses should be occasionally repeated for four or five days after fragments of the worm have ceased to come away.

Sabadilla, L. E. *Cevadilla. Fruit of Helonias officinalis*, L.—*of Veratrum Sabadilla, of Helonias officinalis, and probably of other Melanthaceæ*, E.—*of Asagræa officinalis*, Lindley. A native of Mexico, belonging to the Linnæan class and order *Polygamia Monœcia*, and to the Natural family *Melanthaceæ*.

Botanical Characters.—A bulb, sending up numerous grassy leaves, from the centre of which springs an annual stem, about six feet in height, terminated by a spike of small white flowers, succeeded by numerous trifollicled capsules.

Physical Properties.—The fruit consists of three follicles, oblong, adherent at the base, about half an inch in length; they are composed

of a thin yellowish, elastic membrane, containing from one to three shining black-seeds; the seeds have little odour, but when powdered and snuffed into the nostrils, they produce violent sneezing and a discharge of mucus; they have an acrid, intensely bitter taste, which is very permanent.

Chemical Properties.—Cevadilla consists of fatty matter, *cevadic acid*, wax, *veratria* combined with gallic acid, yellow colouring matter and gum.

Therapeutical Effects.—Although possessed of highly poisonous properties, cevadilla has been employed internally as an anthelmintic with much success in cases of tape-worm, and of ascarides; its use has been hitherto almost entirely confined to the Continent, and from the numerous instances of its successful employment recorded by different practitioners, it appears deserving of a high character as a vermifuge.

Dose and Mode of Administration.—In powder, gr. iij. for eight successive mornings fasting, followed on the ninth day by an active purge, in cases of tænia.—*Enema of Cevadilla*, (Cevadilla, ℥ij.; water, f℥x.; milk, f℥iij.; the cevadilla is boiled in the water, until it is reduced to seven ounces, then filtered, and the milk added). To be administered in cases of ascarides.

Spigelia, L. E. Spigelia marilandica, radix, D. *Carolina-pink; Root of Spigelia Marilandica.* A native of the United States; belonging to the Linnæan class and order *Pentandria Monogynia*, and to the Natural family *Gentianaceæ (Loganiaceæ*, Lindley).

**Botanical Characters.—A perennial root; sending up numerous simple stems; bearing, in the month of July, rich carmine-coloured flowers, in racemes.**

Physical Properties.—Usually met with in bundles of the entire plant about twenty inches long, the officinal part consists of numerous, slender, yellowish-brown fibres, proceeding from a small, dark-brown rhizome. They have a faint odour, and a bland, somewhat nauseous taste.

Chemical Properties.—The root consists of acrid resin, tannin, bitter extractive, and woody fibre, with a trace of fixed oil.

Therapeutical Effects.—Spigelia root, in consequence of its being much more active in the recent state than when dried, bears a higher character as an anthelmintic in America than in Europe. It is the most popular vermifuge in the United States for the expulsion of lumbrici, possessing, however, little or no powers over any other species of intestinal worm.

Dose and Mode of Administration.—In powder, gr. x. to gr. xx. for children. *Infusum Spigeliæ*, U. S. (Spigelia root, ℥ss.; boiling water, f℥xvj.; macerate for two hours and strain). Dose, f℥ss. to f℥i. for a child, four times the quantity for an adult. However administered, it should be always followed by a strong mercurial purge.

Stanni pulvis, D. L. E. *Powder of Tin.* Tin is found in nature chiefly in the form of peroxide, existing in large quantities in Cornwall, in South America, and in the East Indies.

Preparation.—The metal is separated from the impurities which exist with it in the ore, by smelting and liquation. For medical purposes it is reduced to powder, by agitating it while in a state of fusion in a wooden box the inside of which has been rubbed with chalk, (in a mortar previously heated, triturating briskly as it cools, E.), and separating the finer particles by means of a sieve; D. E.

Physical Properties.—Metallic tin is of a bluish-white colour, brilliant, soft and malleable, with but little tenacity; it emits a slight peculiar odour when rubbed. Sp. gr. 7·3.

Chemical Properties.—It melts at 442° F., if the heat be increased it oxidises rapidly, and at a red heat burns brightly; it dissolves slowly in dilute muriatic acid, but rapidly if the acid be strong and boiling; nitric acid slightly diluted acts on tin with great violence, heat is produced, orange fumes disengaged, and pure peroxide of tin is formed.

*Adulterations.*—Pewter filings are sometimes substituted for tin filings in commerce; and Christison says, that lead powder is not unfrequently sold for powder of tin. These adulterations may be detected by first acting on the specimen with nitric acid, so as to convert it into the peroxide, boiling the powder thus obtained with distilled water, when, should the tin be pure, the water will not precipitate with solution of sulphate of magnesia.

Therapeutical Effects.—Powder of tin is a most effectual anthelmintic, especially for children, in cases of lumbrici, not so useful in cases of ascarides, and producing little or no effect in cases of tænia. It appears to act mechanically, and consequently, its administration should be always followed by an active cathartic.

Dose and Mode of Administration.—℥ss. to ℥i. made into an electuary, with an equal quantity of honey or treacle.

Tanacetum vulgare, folia, D. *Common Tansy.* Indigenous; belonging to the Linnæan class and order *Syngenesia Superflua*, and to the Natural family *Compositæ (Asteraceæ* Lindley).

Botanical Characters.—Stem two to three feet high, bearing a corymb of yellow flowers.

Physical Properties.—The whole plant has a disagreeable, camphoraceous odour, and a nauseous, bitter, aromatic taste.

Chemical Properties.—The most important constituents of the plant are bitter resin, and volatile oil. Leroy has recently obtained a peculiar principle from it which he has named *tanacetine.*

Therapeutical Effects.—Though rarely employed in regular practice, it is frequently administered as a vermifuge with much benefit as a domestic remedy; it is only applicable for cases of lumbrici.

Dose and Mode of Administration.—In powder, ℈i. to ℥i. *Infusum Tanaceti;* (Leaves ℥ij.; boiling water, Oj.; macerate for an hour.) Dose, f℥i. or f℥ij.

Terebinthinæ oleum, D. L. E. *The volatile oil distilled from the liquid resinous exudation* (Terebinthina vulgaris, D. L.) *of various species of Pinus and Abies*, E.—*of Pinus sylvestris*, D. L. *Oil of turpentine; Spirits of turpentine.* The trees from which the varieties of common turpentine met with in commerce are procured, are inhabitants of the forests of the colder regions of Europe and North America, and most of them are cultivated in the British isles; they are placed in the Natural family *Coniferæ* (*Pinaceæ*, Lindley), and in the Linnæan class and order *Monœcia Monadelphia.*

Preparation.—*Common Turpentine, Terebinthina vulgaris,* is procured in America, by cutting off the outer bark near the root of the tree, and making an incision through the inner bark into the wood; as the turpentine exudes, it flows into a hole dug in the earth, whence it is removed into casks. *Volatile oil of turpentine,* is an article of the Materia Medica in the Lond. and Edin. P.s. being always prepared by the manufacturer on the large scale. The Dublin College gives the following formula for its preparation. "Common turpentine, *by weight* ℔v.; water, *by measure* ℔iv.; distil the oil from a copper alembic; yellow resin will remain after the distillation." This oil is further directed to be purified; *Oleum Terebinthinæ purificatum*, L. E.—*rectificatum*, D. (Oil of turpentine, *by measure* ℔ij. (Oj.; L. E.); water, *by measure* ℔iv. (Oiv.; L. E.); distil till ℔iss *by measure* of the oil be obtained, (distil the oil cautiously, L. E.)

Physical Properties.—Oil of turpentine is a transparent, colourless, limpid fluid; of a peculiar, penetrating, balsamic odour; and a pungent, bitter, disagreeable taste. Sp. gr. ·872 at 50°F.

Chemical Properties.—It is composed of $C^{20}$ $H^{16}$. It is very soluble in ether, less so in alcohol, and very sparingly soluble in water. Exposed to the air it gradually absorbs oxygen, thickens and becomes yellowish. It boils at 314°, and cooled down to—17° it deposits white crystals *stearopten*, which are heavier than water. Oil of turpentine is very inflammable, burning with a heavy, yellowish flame, and much smoke; in chlorine gas it takes fire spontaneously.

Therapeutical Effects.—As the most effectual remedy we possess for the expulsion of tape-worm, oil of turpentine stands deservedly in high repute. It operates as a specific poison to the parasite, causing its immediate death, and afterwards, in consequence of its cathartic properties, expelling it from the body. It has been also used with much benefit in the form of enema for ascarides in the rectum. (See, *Cathartics, Diuretics* and *Stimulants).*

Dose and Mode of Administration.—*As an anthelmintic;* for adults, f℥ss. to f℥ij.; for children, f℥i. to f℥ss. It may be given either floating on the surface of water, or made into an emulsion with mucilage, (of which it requires equal portions), or with yolk of egg, (one to every ounce).—*Enema Terebinthinæ*, D. L. E. (Common turpentine, ℥ss. (oil of turpentine, f℥j., L. E.); yolk of one egg (a sufficiency, L. E.); water, (of a temperature not exceeding 100°, D.) (decoction of barley, L.), f℥x. (f℥xix., L. E.); rub the oil and the yolk together, and add the water gradually, D. E.—Mix, L.).

# CHAPTER III.

## ANTISPASMODICS.

Antispasmodics, as their name indicates, are medicines which counteract irregular or inordinate muscular action—*spasm*. This deranged state of the system depends on so many different causes, and is produced by so many different sources of irritation, that its successful treatment will very frequently depend on the employment of remedies calculated to remove the more immediate cause or source of irritation, by which the spasmodic affection is produced. It follows, therefore, that under peculiar circumstances the remedies, which will be found most successful in counteracting spasm, must be derived from very different divisions of the Materia Medica; and thus the term Antispasmodic will become applicable to a *narcotic*, a *sedative*, a *stimulant*, a *cathartic*, or a *tonic*. There are, however, certain medicines which appear to exert a direct control over spasmodic action independent of any influence upon its exciting causes, and these will form the subject of our inquiry in the present chapter.

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Assafœtida, D. L. E. *Gummy-resinous exudation of Ferula assa-fœtida*, D. L. E.—*probably also of Ferula Persica*, E. A native of Persia, especially the provinces of Khorasan and Laristan; belonging to the Linnæan class and order *Pentandria Digynia*, and to the Natural family *Umbelliferæ (Apiaceæ*, Lindley.)

Botanical Characters.—The root is long, tapering, of the thickness of a man's leg, black externally, white and juicy internally; of a powerful alliaceous odour, sending up many radical leaves, about two feet long; and after some years a round stem clothed with leafless sheaths, eight or nine feet high, and bearing yellow flowers in umbels, succeeded by flat thin reddish-brown fruit. The whole plant dies after it has once flowered and ripened its seed.

Preparation.—When the plant is four years old, the root-leaves are removed, and in forty days afterwards the top of the root is sliced off, a fetid juice exudes, which concretes in a couple of days, is then scraped off, and a fresh slice of the root made—more juice exudes, is collected as above, and the same process repeated from ten to twelve times within six weeks—until the root is completely exhausted. The juice is exposed to the sun to become harder, and then packed in casks and cases which are sent, by way of Bombay, to Europe.

Physical Properties.—Assafœtida is met with in commerce in irregular lumps from half a pound to three pounds in weight; of a pinkish-

yellow, and reddish-brown colour externally; when recently cut, of a pearl-white colour with a waxy lustre, but on exposure to the air rapidly acquiring a rose tint. It has a powerfully disagreeable, peculiar, alliaceous odour, and a strong, bitter, acrid taste. Sp. gr. 1·31 to 1·35.

Chemical Properties.—It is composed of 47·20 per cent of resin, 4·60 of volatile oil, 19·40 of gum with traces of saline matters, 9·70 of sulphate and carbonate of lime, with some bassorin, extractive, lignin, &c. (Brandes). The resin and volatile oil are the medicinal principles. Exposed to the air it is apt to become very hard owing to the presence of the sulphate of lime, the *setting* of which is supposed to be the cause. Assafœtida softens with a moderate heat; and is inflammable, burning with a fuliginous flame. It is partially soluble in alcohol, ether and vinegar; and it may be formed into an emulsion with water. It is reduced to powder with difficulty, unless it be triturated with carbonate of potash.

Therapeutical Effects.—Assafœtida is a powerful stimulating antispasmodic, especially adapted for the spasmodic nervous diseases of females, as hysteria and some forms of chorea and epilepsy. No remedy we possess is so successful in the treatment of hysteria, administered either during the paroxysm or in the interval; in a hysteric paroxysm, we are frequently unable to administer medicines by the mouth; when, given in the form of enema, assafœtida is found to be very effectual. In the convulsions of infants, especially when dependant on flatulence, and in the flatulent constipation of the aged, few remedies are more efficacious. It has been also employed with much benefit in the chronic spasmodic stage of hooping cough, in pure spasmodic asthma, and in that peculiar spasmodic difficulty of breathing, so frequently the attendant of chronic catarrh. Assafœtida has been also used as a vermifuge.

Dose and Mode of Administration.—Gr. x. to ʒss. in pills or emulsion.—*Mistura Assafœtidæ*, D. L. (Assafœtida, ʒi. (ʒv. L.); pennyroyal water, fʒviij. (water, a pint, L.); Rub the assafœtida with the water, gradually poured in, until an emulsion is formed). Dose, fʒss. to fʒiss.; used also as an enema for children.—*Tinctura Assafœtidæ*, D. L. E. (Assafœtida, ʒiv. (ʒv. L. E.); rectified spirit, *by measure* Ibij. (Oij. L. E.); (water, fʒviij. D.); macerate for 14 (7, E.) days and filter). Dose, fʒss. to fʒij.—*Spiritus Ammoniæ fœtidus*, D. E. (Spirit of ammonia, *by measure* Ibij. (fʒxss. E.); assafœtida, ʒi¼. (ʒss. E.); "Macerate in a close vessel for three days, agitating occasionally; then pour off the clear liquor, and distil Ibiss. *by measure*;" D.—"Break the assafœtida into small fragments; digest it in the spirit for twelve hours; distil over fʒxss. by means of a vapour bath;" E.)—L. (Hydrochlorate of ammonia, ʒx.; carbonate of potash, ʒxvj.; rectified spirit; and water, of each, Oiij.; assafœtida, ʒv.; mix and distil, with a slow fire, three pints). Dose, fʒi. This is merely a solution of the volatile oil of assafœtida in the spirit of ammonia.—*Pilulæ Galbani comp.*, D. L. (Assafœtida, ʒss.; myrrh; and sagapenum, of each, ʒiss; galbanum, ʒj.; treacle (syrup, L.), a sufficiency).—*Pilulæ Assafœtidæ*, E. (Assafœtida; galbanum; and myrrh, of each, three parts; conserve of red roses, four parts, or a sufficiency). Dose, gr. x. to ℈j.—*Enema fœtidum*, D. E. (Add two drachms of tincture of assafœtida to the *enema cathartieum*).—*Emplastrum Assa-*

*fœtidæ*, E. (Litharge plaster; and assafœtida, of each, ℥ij; galbanum; and bees' wax, of each, ℥i.; liquefy the gum resins together and strain them, then add the plaster and wax also in the melted state, and mix all thoroughly). Applied externally in hysteria, flatulence, and hooping cough.

Castoreum, D. L. E. *A peculiar secretion (concretion, L.), from the præputial follicles of Castor fiber;* L. E. *Castor.* The beaver, an inhabitant of the Northern parts of Europe and of North America, is placed by Cuvier in the class *Mammalia*, order *Rodentia.* Both the male and female beavers are furnished with castor sacs. In the living animal the secretion contained in them is fluid, but when removed from the animal it rapidly concretes.

Physical Properties.—As met with in commerce, North American castor (the only kind now imported into Britain) consists of the two sacs united together by a kind of natural ligament; they are wrinkled; of a reddish brown colour externally, paler internally; breaking with a somewhat resinous fracture; sometimes quite hollow in the centre. It has a strong, peculiar, disagreeable odour, and a somewhat aromatic, bitter taste.

Chemical Properties.—It contains volatile oil *(Carbolic acid)*, resin, albumen, a peculiar principle discovered by Brandes and named by him *Castorine* and to which he says it owes its properties, fatty matter, mucus, carbonate of ammonia, and salts of soda and potash. Castor yields its active principles almost entirely to alcohol, and but very imperfectly to water.

Therapeutical Effects.—Castor was formerly in high esteem as an antispasmodic, but in the present day has nearly fallen into disuse, its employment being restricted to some of the milder forms of hysteria, in which, any benefit it produces is probably owing to its nauseous smell and taste.

Dose and Mode of Administration.—In substance from ℥i. to ℥ij.—*Tinctura Castorei*, D. L. E. (Castor, powdered (bruised, E.), ℥ij. (℥iiss. L. E.); proof spirit, *by measure* ℔ij. (rectified spirit, Oij. L. E.); macerate for seven (fourteen, L.) days and strain, "may also be prepared by percolation, like tincture of cassia;" E.). Dose, f℥ij. to f℥iv.—*Tinctura Castorei comp.*, E. (Castor bruised, ℥iiss.; assafœtida in small fragments, ℥x.; spirit of ammonia, Oij.; digest in a well-closed vessel for seven days, strain and express strongly the residuum and filter. This tincture cannot be so conveniently prepared by the method of percolation.) Dose, f℥i. to f℥ij.

Fuligo ligni, *wood soot*, formerly contained in the British Pharmacopœias, is still much used on the continent, and for some years back, has been employed with excellent effect, as an antispasmodic, by many physicians in this city. It has been found most beneficial in the latter stages of hooping-cough in children, and in some forms of hysteria. It is prepared by burning wood under a small flue, and collecting the soot

which is deposited in the chimney. It consists of a peculiar extractive matter called *pyretin*, some acetic acid, acetates of soda, potash, magnesia, and ammonia, creasote, &c. It yields its active properties partly to water, but more completely to alcohol. The preparations of soot that have been employed are as follows:—*Decoctum Fuliginis*, (Wood soot, ʒiv.; boiling water, Oiss.; boil down to Oj. and strain). Only used as an external application to chronic eruptions of the scalp, and to obstinate ulcers.—*Tinctura Fuliginis*, (Wood soot, ʒij.; assafœtida, ʒi.; proof spirit, fʒxxxij; digest for three days and strain). Dose, fʒj. to fʒij.—*Spiritus Fuliginis*, (Wood soot, one part; proof spirit, five parts; water, fifteen parts; distil four parts). Dose, min. xx. to min. xxx. *Extractum Fuliginis*, (Wood soot, 1 part; boiling water, 8 parts; boil for fifteen minutes, strain through linen and evaporate to a proper consistence). Dose, gr. v. to gr. x.

Galbanum, D. L. E.—*Concrete gummy-resinous exudation of Opöidia galbanifera, (probably of a species of Opöidia*, E.—*of Bubon Galbanum*, D.—*of Galbanum Officinale*, L.*)*. The plant which yields Persian galbanum is that named above; it belongs to the natural family *Umbelliferæ (Apiaceæ*, Lindley*)*, and to the Linnæan class and order *Pentandria Digynia*. It is imported from India, and from the Levant.

Physical Properties.—It occurs both in tears and in lump; the tears are globular, irregular, about the size of a pea, usually agglutinated into masses of a pale greenish-yellow colour, somewhat translucent, having a strong peculiar odour, and an acrid, disagreeable, bitter taste; the lump variety is of a darker colour, rather opaque, with a less powerful odour and taste; when exposed to cold both kinds become brittle, and may be readily reduced to powder.

Chemical Properties.—Galbanum consists chiefly of resin and gum, with a small proportion of volatile oil, and some bassorine. It is nearly entirely soluble in proof spirit, and partially so in rectified spirit and in ether; it forms an emulsion with water, and is rendered softer, but not melted by heat.

Therapeutical Effects.—Galbanum is employed in the same cases as assafœtida, with which it is generally combined, being less energetic than that substance. It is more frequently employed externally, as a stimulating antispasmodic, being better suited for plasters in consequence of its consistence.

Dose and Mode of Administration.—In substance, either in pill or emulsion, gr. x. to gr. xx.—*Tinctura Galbani*, D. (Galbanum, in small fragments, ʒij.; proof spirit, *by measure* ℔ij.; digest for seven days and filter). Dose, fʒi. to fʒij.—*Emplastrum Galbani*, D. (Litharge plaster, ℔ij.; galbanum, ℔ss.; yellow wax, sliced, ʒiv.; add the litharge plaster, and the wax to the melted galbanum, and then melt all together with a medium heat).—L. (Galbanum, ʒviij.; lead plaster, ℔iij; common turpentine, ʒx.; resin of the Spruce Fir powdered, ʒiij; Add first the resin, then the plaster melted with a slow fire to the galbanum and turpentine melted together, and mix them all). Applied externally, spread on leather.

Moschus, D. L. E.—*Inspissated secretion* (*concretion*, D.) *from the præputial follicles of Moschus moschiferus; Musk.* The musk animal, an inhabitant of the mountains of Eastern Asia, especially frequenting the steppes of the Altai, the banks of the river Irtysch, Mongolia, Thibet and Butan, as far as Tonquin, is placed by Cuvier in the class *Mammalia*, order *Ruminantia*. In the male animal immediately in front of the præputial orifice, is situated a small sac filled with a viscid fluid, which in the dry state constitutes musk. It is imported into the British market principally from China.

Physical Properties.—The musk-bag, or as it is commonly called musk-pod, is somewhat oval, about $2\frac{1}{2}$ inches long, and $1\frac{3}{4}$ inches broad, smooth and bare on one side, somewhat convex, and covered with stiff, brownish-yellow hairs on the other; it contains from ʒiss. to ʒiij. of musk. Musk is in the form of small unctuous grains, of a deep reddish-brown colour, mixed with whitish hairs; it has a strong, peculiar, diffusible, very persistent odour, and a bitter aromatic taste.

Chemical Properties.—Musk consists of ammonia, stearine, elaine, cholesterine, acid oil combined with ammonia, volatile oil, an undetermined acid, gelatin, albumen, fibrine, carbonaceous matter, and numerous salts, *(Guibourt and Blondeau.)* It yields its active principles partially to water, but more completely to alcohol.

*Adulterations.*—Grain musk is usually adulterated; dried bullocks' blood is employed for this purpose; it may be detected by adding to an infusion of the suspected drug solution of corrosive sublimate, if it be genuine it will not precipitate. Spurious musk-bags are not uncommon in commerce, they are most easily detected by the microscopic characters of the hairs with which they are covered, as I first pointed out in the *Dublin Quarterly Journal*, Vol. I. n. s. p. 77. The hairs of the true musk-bag are furnished internally with distinct, regular, colour cells; while none can be perceived in those found on the spurious pods.

Therapeutical Effects.—Musk is not much prescribed now in consequence of its high price, it is nevertheless a stimulating antispasmodic of great power, and is administered with excellent effect in hysteria, in chorea, and in the subsultus tendinum and hiccough of fevers and other diseases assuming a typhoid type. In cases of hysteria of long standing, so nearly allied to epilepsy as to be scarcely distinguishable from it, I have obtained very beneficial results from the employment of musk.

Dose and Mode of Administration.—In substance, gr. x. to gr. xx.—*Mistura Moschi*, L. (Musk; gum arabic, powdered; and sugar, of each, ʒiij.; rose water, Oj.; rub the musk with the sugar, then with the gum, the rose water being gradually poured in). Dose, fʒi. to fʒij.—*Tinctura Moschi*, D. (Musk, in powder, ʒij.; rectified spirit *by measure* ℔j.; macerate for seven days and filter). Too weak for medical use. Dose, fʒiij. to fʒvj.

Incompatibles.—Sulphate of iron; nitrate of silver; corrosive sublimate; and infusion of bark.

Opopanax, D. L. *Gum-resin of Opopanax chironium*, L.—*of Pastinaca Opopanax*, D. This plant is a native of the South of Europe. It

belongs to the Linnæan class and order *Pentandria Digynia*, and to the Natural family *Umbelliferæ* (*Apiaceæ*, Lindley). Opopanax is obtained by incisions into the root; it occurs in reddish-yellow tears, possessing a somewhat fetid but faint odour, with a bitterish acrid taste; it consists chiefly of gum and resin with a small quantity of volatile oil, starch, and extractive matter. This substance is quite obsolete in medical practice; it was formerly employed in the same cases as assafœtida and galbanum, which it resembles in its physiological properties.

Ruta, L. E. Ruta graveolens, folia, D. *Rue; Leaves, (and unripe fruit,* E.*) of Ruta graveolens.* A native of the South of Europe, cultivated in our gardens. It belongs to the Natural family *Rutaceæ*, and to the Linnæan class and order *Decandria Monogynia*.

**Botanical Characters.—A small branching shrub; with glaucous bluish-green leaves, and yellow flowers in umbellate racemes.**

Physical Properties.—Although the leaves only are ordered by the Dublin and London Colleges, the entire plant is met with in the shops. It has a strong, disagreeable, somewhat aromatic odour in the fresh state, much of which is lost in drying; and a bitter, acrid, unpleasant taste.

Chemical Properties.—Its medicinal properties depend on volatile oil, and bitter extractive; the former, *Oleum Rutæ*, is officinal in the Dub. & Edin. Phar.; it is obtained by distilling the fresh herb with water. Oil of Rue is of a rich yellow colour, becoming darker by age; it has the peculiar odour of the plant in a marked degree, and a bitter, acrid, warm taste; its sp. gr. is 0·911. Rue yields its active properties to boiling water, but by decoction the volatile oil is dissipated.

Therapeutical Effects.—Rue is a stimulating antispasmodic of some power, although not much employed in the present day. It has been administered with benefit in the spasmodic colic and general convulsions of children; and in the hands of some practitioners is said to have proved useful in hysteria and idiopathic epilepsy.

Dose and Mode of Administration.—Preparations of the fresh herb should be always employed, as the infusion (prepared by infusing ℥i. of the herb in Oj. of boiling water, in a covered vessel, for an hour); or the oil; the dose of the former is f℥i. to f℥ij.; of the latter min. ij. to min. v. in some agreeable syrup.—*Extractum Rutæ*, D. (Prepared as the simpler extracts). A useless preparation, the volatile oil being dissipated in the process. Dose, gr. x. to gr. xx.—*Conserva Rutæ*, D. *Confectio Rutæ*, L. (Rue, (dried, L.); carraway; bay berries, of each, ℥iss.; sagapenum, ℥ss.; black pepper, ℥ij.; despumated honey, ℥xvj.; "Rub together to a very fine powder, and having added the honey, mix all well;" D. "Rub the dry ingredients together to a very fine powder and preserve them; then, whenever the confection is to be used, add the honey to them, and mix them all;" L.). Only used in enemas in the spasmodic affections of infants and children. From ℈j. to ℥j. is added to f℥vj, or f℥viij. of thin gruel.

Sagapenum, D. L. *Gum-resin, obtained from an unascertained plant (species of Ferula,* L.). Imported from the Levant.

Physical Properties.—It occurs in semi-translucent masses of a dark brownish-yellow colour, consisting of numerous tears agglutinated together; it has a fetid odour, weaker than assafœtida, and a hot, acrid taste; it breaks with a horny fracture.

Chemical Properties.—According to the analysis of Pelletier, sagapenum consists of gum, resin, volatile oil, bassorin and some salts.

Therapeutical Effects.—Sagapenum produces effects precisely similar to, but weaker than, assafœtida, it is consequently scarcely ever employed now.

Dose and Mode of Administration.—In substance, given in the form of pill, gr. v. to gr. xx.—*Pilulæ Sagapeni comp.* L., (Sagapenum, ʒj.; aloes, ʒss.; syrup of ginger, q. s.; Beat together until they are incorporated). Dose, gr. v. to gr. xx. A useful purgative and antispasmodic in the flatulent colic of dyspepsia.

Succinum. D. L. *Amber.* An oil *(Oleum Succini),* and an acid *(Acidum Succinicum),* are still retained, both in the Dublin, and the former in the London Pharmacopœia.

Preparation.—*Acidum Succinicum, et Oleum Succini*; D.—"Amber, coarsely powdered; and pure sand, of each, one part. Distil, with a gradually increased heat, an acid liquor, an oil, and an acid in the form of crystals. Compress the crystals wrapped up in bibulous paper, until the oil is expelled and sublime them again. The oil may be separated from the acid liquor by filtering through bibulous paper." *Oleum Succini;* L.—"Put amber into an alembic, so that an acid liquor, an oil, and a salt contaminated with the oil, may distil in a sand-bath, with a heat gradually increased. Afterwards let the oil distil again and a third time."

Although once highly esteemed in medicine as antispasmodics, these preparations really possess such feeble medicinal properties, and are so little employed in the present day, that we may very well omit any account of them here. The dose of the oil is from min. v. to min. x.; that of the acid, from gr. v. to gr. viij.

Valeriana, D. L. E. *Root of Valeriana officinalis.* An indigenous plant, belonging to the Linnæan class and order, *Triandria Monogynia,* and to the Natural family, *Valerianaceæ.*

Botanical Characters.—The root is tuberous, perennial, sending up a smooth erect furrowed stem, from two to four feet high, which produces rose-coloured flowers in a somewhat panniculed corymb.

Physical Properties.—The root, which should be dug up in autumn when the leaves have decayed, or in spring before the stem rises, consists of a short tuberous root-stock, and numerous root fibres from two to six inches long, yellowish-brown externally, whitish internally, of a strong, penetrating, characteristic odour, and a bitter acrid, somewhat aromatic taste. The roots of those plants which grow on the banks of rivers or in marshy places, are inert.

Chemical Properties.—It consists of woody fibre, resinous extractive, gummy extractive, resin, and a little more than one per cent of volatile oil; a peculiar acid also exists in it, which has been named *valerianic acid.* The volatile oil may be obtained from the fresh root by the ordinary process of distillation; it is a mixture of a peculiar oil having a camphoraceous odour, and of valerianic acid. It is to the valerianic acid that the active properties of the plant are due; numerous processes have been lately proposed for obtaining it, but the most simple is by decomposing the valerianate of zinc by an acid and distilling. Thus prepared it bears much resemblance to the volatile fatty acids; it is an oily liquid, colourless, with a strong, persistent odour of valerian, and an acid, pungent taste; it is very soluble in water, alcohol, and ether; its density is ·944, and its composition, $C^{10}$, $H^9$, $O^3$. Valerian imparts its properties to both water and rectified spirit. Magnesia combined with valerian completely removes its odour, which may be again restored by the addition of sulphuric acid.

Therapeutical Effects.—Valerian is a stimulating antispasmodic, its action being particularly manifested on the cerebral organs; thus, when given in large doses, it produces head-ache, loss of vision and vertigo. It was formerly used as a remedy in rebellious intermittents, and in adynamic fevers, but in the present day it is only employed as an antispasmodic, and opinions differ much with respect to its efficacy as such. My own experience leads me to place much reliance on it in the treatment of aggravated cases of hysteria, which so often bear a close resemblance to epilepsy, and also in many nervous affections; however, I have always remarked that it soon loses its antispasmodic powers, even though the dose be increased.

Dose and Mode of Administration.—In powder, ʒss. to ʒj.; of the oil, min. iij. to min. v.—*Infusum Valerianæ,* D. L. (Valerian, (in coarse powder, D.), ʒij. (ʒss. L.); boiling (distilled, L.), water, fʒvij. (Oj. L.); digest for an hour (half an hour in a covered vessel, L.) and strain). Dose, fʒj. to fʒij.—*Tinctura Valerianæ,* D. (Valerian in powder, ʒiv.; proof spirit, *by measure* ℔ij.; macerate for seven days and filter).—L. E. (Valerian bruised, ʒv.; proof spirit, Oij.; macerate for fourteen, (seven, E.) days, and strain; "or prepare by percolation," E.) Dose, fʒij. to fʒiv.—*Tinctura Valerianæ Ammoniata,* D. (Valerian in powder, ʒij.; spirit of ammonia, *by measure* ℔j.; macerate for seven days, and filter).—L. E. (Valerian bruised, ʒv.; (aromatic, L.) spirit of ammonia Oij.; macerate for fourteen days (seven, E.), and strain; "or prepare by percolation," E.). Dose, fʒj. to fʒij.

Incompatibles.—The alkalies; the earthy, and metallic oxides; and all salts of iron.

## Zinci Valerianas.—*Valerianate of Zinc.*

Preparation.—Take of, the bruised root of valerian, ℔ij.; water, ℔viij.; sulphuric acid, ʒiij. ʒi.; macerate for two days and distil until the liquid no longer reddens bibulous paper. Let the distilled liquor be then exposed to the air for a month; at the end of which time put it into a mattrass, with ʒss. of

recently precipitated, perfectly pure, hydrated oxide of zinc; and digest for from eight to ten hours on a sand-bath, heated to 176°F, stirring occasionally. Filter the warm liquor, evaporate it to three-fourths of its volume, pour into porcelain capsules, and expose to the heat of a stove until crystals are formed, which are to be dried with filtering paper. Brun Buisson.*

Physical Properties.—Valerianate of zinc, when pure, occurs in brilliant, pearly, tabular crystals, of a snowy whiteness. It has a somewhat bitter, disagreeable taste, and a feeble odour of valerian.

Chemical Properties.—It is composed of one atom of valerianic acid and one of oxide of zinc. It is soluble in water, alcohol, ether and the oils. Heated to 122° it softens, at 300° it melts and parts with its water of crystallization and a portion of its acid, and at a higher temperature it burns with a strong empyreumatic odour and is decomposed, a carbonaceous oxide of zinc being left. Valerianate of zinc is very readily decomposed, most acids setting free the valerianic acid and combining with the oxide of zinc. It also undergoes partial decomposition, if exposed to the air, or even if kept in badly stopped bottles.

*Adulterations.*—As met with in the shops, this salt is often of bad quality, in consequence either of having been originally badly prepared or of having been badly preserved. When this is the case, it emits a *strong* odour of valerian, and is not completely soluble in water. Most of the valerianate of zinc met with in commerce at present, especially that which is prepared in Paris, is nothing more than the butyrate of zinc to which some oil of valerian has been added; this fraud may be detected by distilling the suspected salt in a glass retort with dilute sulphuric acid and water; on testing the liquid which comes over, with solution of acetate of copper, a bluish-white precipitate will be produced if it be the butyrate, but no change occurs if the salt be the valerianate of zinc.

Therapeutical Effects.—Valerianate of zinc is a tonic antispasmodic of much power, and as such is peculiarly adapted for the treatment of neuralgic affections, which are so generally dependant on loss of tone in the system. It has been found especially useful in the treatment of facial neuralgia and of vertigo; but I have seen it prove equally beneficial in most of the protean forms of hysterical neuralgia. In short I look on it as one of the most valuable modern additions to the Materia Medica, and I fully agree with the observations of Devay, that the chemical combination proves much more beneficial than the oil of valerian and oxide of zinc prescribed together.

Dose and Mode of Administration.—The dose of it is from three-fourths of a grain to one grain twice or three times a day; it may be prescribed in the form of pill made with a little mucilage or conserve of red roses, or in solution in orange-flower water, or in distilled water flavoured with syrup of orange-flowers. The compounder must bear in mind that the crystals of valerianate of zinc do not dissolve readily in cold water, floating on the surface in consequence of their lightness; they

* This process is recommended by the Committee of the Pharmaceutical Society of Paris, as being the best and the most economical. *Journal de Pharmacie*, February, 1846.

should, therefore, be first incorporated with a few drops of water in a mortar.

Incompatibles.—All acids; the soluble carbonates; most metallic salts; and astringent vegetable infusions or decoctions.

# CHAPTER IV.

## ASTRINGENTS.

(Styptics—Desiccants—Constringents.)

Astringents may be defined, substances which produce contraction and condensation, when they come in contact with living matter. The more immediate effect of astringents is to diminish secretion and excretion; ultimately they exert a tonic influence on the human body. Hence then they appear to be very nearly allied to *tonics*; indeed, in many instances the most powerful tonics will be obtained from the division Astringents. Much difference of opinion exists as to the *modus operandi* of this class of remedial agents. Since the time of Cullen, this has been generally explained by a reference to their action in *tanning*; for the same substances which, by a peculiar chemical action, harden and condense dead animal matter, operate as astringents on the living system. This hypothesis may, to a certain extent, hold good as to the local action of astringents when applied to a morbidly secreting surface, that is to say, they act by constringing the extreme vessels of the part. But it will not account for their power in checking discharges from remote parts, when they are introduced into the system through the digestive organs; in the latter case we must suppose that they produce some peculiar change in the living principle of the structure generally, which is incompatible with excessive secretion or discharge. In cases where the use of astringents is indicated, it will be always necessary, in the first instance, to ascertain the cause by which the morbid discharge is produced, as it often occurs in diametrically opposite states of the system, and therefore very different remedies will, in different cases, assume the character of an astringent. Thus, where irritability exists opium, taken from the division narcotics, will often prove our most useful remedy, given either alone or as an adjuvant to some more immediate astringent. If a state of plethora of the vascular system exist, bleeding and other depletory mea-

sures will be indicated; or if the discharge, as in some forms of diarrhœa, be caused by acrid or acid matter, emollients or demulcents, and antacids must be employed.

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ACETUM, L. ACETUM VINI, D. ACETUM GALLICUM ET BRITANNICUM, E. *Vinegar prepared by fermentation,* L. *Wine vinegar,* D. *French or British vinegar,* E.

PREPARATION.—Vinegar is an article of the Materia Medica in the three British Pharmacopœias. In France it is prepared from the lighter wines, by exposing them to the air in large wooden vessels placed in a room, the temperature of which is raised to between 68° and 80° F. In Britain, various kinds of malt liquor, cider, raw sugar dissolved in water, &c. are substituted for wine. Of late years, a greatly improved process has been introduced in Germany by which vinegar may be made in 36 hours:—Strong alcohol is diluted with five or six parts of water, and about a thousandth part of yeast, honey, or impure vinegar added to it; the mixture is heated to 75° or 80° and made to trickle slowly through a mass of beechwood shavings, contained in a tall cask, narrowed at the bottom, and pierced with small holes at the top and lower part, to allow a circulation of air; as soon as the mixture is passed through the barrel three or four times, it is converted into vinegar; the change being effected by the alcohol absorbing oxygen from the atmospheric air; the process taking place very rapidly owing to the great surface of the liquid which is exposed.

PHYSICAL PROPERTIES.—Vinegar is of a pale reddish-yellow colour, transparent; with a sharp, peculiar *(acetous)* odour, and an acidulous, refreshing taste. Sp. gr. from 1·006 to 1·019. French, or wine vinegar is generally of a deep colour, and has a more fragrant odour than British, or malt vinegar; its density also is greater, being from 1·014 to 1·022.

CHEMICAL PROPERTIES.—It is composed of acetic acid, colouring matter, mucilage and water, and a trace of alcohol; British vinegar contains also sulphuric acid, manufacturers being allowed by law to add a thousandth part by weight of that acid. Wine vinegar may be distinguished from malt vinegar by "ammonia in excess, causing a purplish muddiness, and slowly a purplish precipitate with it" *(Ed. Ph.);* in addition to the constituents mentioned above, it generally contains some bitartrate and sulphate of potash. The odorous principle of vinegar is conjectured to be acetic ether. Its medicinal virtues depend on the acetic acid it contains.

*Adulterations.*—Vinegar varies much in strength, and also frequently contains many impurities. The density as first shown by *Mollerat,* does not indicate accurately the quantity of acetic acid present; this is more correctly ascertained by its neutralizing power over crystallized carbonate of soda, 144 grains of salt being equal to 51 grains of real acetic acid. The strongest vinegar prepared, which is termed *proof vinegar,* is estimated to contain five per cent of real acid. In the application of this test, however, care must be taken to allow for any sulphuric acid present. The impurities most commonly met with in vinegar are metallic matter,

generally copper or lead; some acrid vegetable substance, as capsicum, grains of paradise, &c.; and sulphuric acid. If the colour be altered on the addition of sulphuretted hydrogen, it contains metallic matter; the presence of an acrid substance may be detected by the taste, the vinegar having been first neutralized with carbonate of soda; the quantity of sulphuric acid contained is indicated by the extent of the precipitate produced with solution of muriate or nitrate of baryta.

Therapeutical Effects.—Vinegar is an excellent refrigerating astringent, and as such is employed with much benefit in the colliquative sweating and diarrhœa of hectic; taken largely diluted with water, as the usual drink of the patient, it will seldom fail to diminish the excessive discharges. As a local astringent it is used to check hemorrhage from the nose, from the uterus, from hemorrhoidal tumours, and from ulcers; in intestinal hemorrhage, enemas containing vinegar have been employed with much advantage, particularly when the bleeding proceeds from the large intestines. In relaxation of the uvula and tonsils, it forms an excellent addition to astringent gargles; and in chronic ophthalmia, diluted with water it is beneficially employed as a collyrium. Finally, in poisoning with the alkalies, or alkaline carbonates, vinegar is one of the best antidotes that can be employed; but in poisoning with most other substances, for which at one time it was very generally used, its administration is in general productive of harm.

Dose and Mode of Administration.—f℥ij. to f℥ss. For an enema, f℥i. to f℥ij. diluted with f℥ij. to f℥iv. of water. As a drink in hectic, f℥iij. diluted with Oiss. of distilled water may be taken in the course of the day.—*Acetum destillatum*, D. L. E.—("Wine vinegar, *by measure* 10 parts; distil 8 parts *by measure*, with a gentle heat in glass vessels, rejecting the first part which comes over. The specific gravity of this acid should be 1·005;" D.—"Take of vinegar, cong. j.; let the vinegar distil in a sand bath, from a glass retort into a glass receiver. Keep the Ovij. first distilled for use;" L.—"Take of vinegar, (French by preference), 8 parts; distil over with a gentle heat, 7 parts; dilute the product, if necessary, with distilled water, till the density is 1·005;" E.). This preparation is preferred to common vinegar, in consequence of its more equable strength, for external use in lotions, eye-washes, &c.—*Oxymel*, D. L. ("Honey, *by weight* ℔ij.; distilled vinegar, *by measure* ℔j.; boil down in a glass vessel, with a gentle heat to the consistence of syrup, removing the scum;" D.—"Honey (clarified), ℔x.; acetic acid, Oiss.; mix the acid with the honey made hot;" L.) An excellent addition to gargles.—*Antihectic mixture*, (Distilled vinegar. f℥ij.; laurel water, f℥ij.; simple syrup, f℥vj.; distilled water, f℥v.; mix.) Dose, f℥i. to f℥ij. every third or fourth hour. An excellent mixture in the profuse sweating of hectic.

Acidum Gallicum.—*Gallic Acid.* A peculiar acid developed in nut-galls, by the decomposition of tannin, under the influence of air and moisture.

Preparation.—"Take of nut-galls, coarsely powdered and the finer powder separated from them, ℔x.; treat the coarse powder first with cold and then

with boiling water in three successive portions, until the whole of the soluble part is dissolved out; express the mass; mix the solutions thus obtained, filter, and evaporate to nearly the consistence of a soft extract. Add this extract in small portions at a time to a boiling ley of soda of the density of 1·40, until all alkaline re-action ceases. When cold, saturate with hydrochloric acid, and a mass of brownish crystals of gallic acid will be precipitated. Separate these crystals by filtration, wash with cold water, and boil them with animal charcoal. Finally, dissolve in alcohol and crystallize. By employing tannin instead of powdered galls, pure gallic acid may be more readily obtained." BUCHNER.

PHYSICAL PROPERTIES.—Gallic acid crystallizes in brilliant, satiny, yellowish-white needles, which are unalterable in the air. It is inodorous, but has a slightly acidulous styptic taste, leaving a sweetish impression on the mouth.

CHEMICAL PROPERTIES.—Its composition in the crystalline state is $C^7H\,O^3 + 3\,HO$. It is very sparingly soluble in cold water or in ether, requires but 3 parts of boiling water for its solution, and is also very soluble in alcohol. It reddens litmus paper, and forms bibasic salts with oxides. When pure it does not precipitate gelatine, by which characteristic it may be distinguished from tannic acid, but like the latter, it gives a bluish-black precipitate with the sesqui-salts of iron. By Buchner's process given above, 7·5 per cent of gallic acid is procured from galls, and from 50 to 60 per cent from tannin.

THERAPEUTICAL EFFECTS.—Gallic acid is a powerful astringent, its effects being particularly manifested on the urinary organs, which is directly proved by the fact of its presence in the urine of those who have taken it, being readily manifested by the addition of a sesqui-salt of iron to that secretion, a few hours after the acid has been swallowed. It is, therefore, a remedy of great value in all forms of hemorrhage from the kidneys or bladder, provided no inflammatory symptoms are present. Its administration is also deserving of a trial in Bright's disease of the kidney, especially in cases where blood is present in the urine. Dr. Locock of London and Dr. Simpson of Edinburgh, have found it a useful astringent in some forms of uterine hemorrhage.

DOSE AND MODE OF ADMINISTRATION.—Gr. v. to gr. x. two or three times a day, in the form of pill, or suspended in water by means of mucilage.

INCOMPATIBLES.—The sesqui-salts of iron.

ACIDUM SULPHURICUM VENALE, D. ACIDUM SULPHURICUM, L. E. *Commercial sulphuric acid; (Specific gravity,* 1·850; D.—1·845; L. 1·840; E.) *Oil of Vitriol.*

PREPARATION.—The method of preparing sulphuric acid, is described in all elementary works on chemistry. The Dublin and Edinburgh Colleges have given formulæ for purifying the acid, in order to obtain it free from the impurities usually met with in the commercial sort; it is then termed, *Acidum Sulphuricum purum*:—"Commercial sulphuric acid, ℔j.; put into a retort of flint glass, attach a receiver of the same kind, and with the joinings left open, apply heat until a twelfth-part shall have distilled over, this is to be rejected as it contains water: having again attached the receiver, distil the residue to dryness. A few slips of

Platinum put into the retort, prevent the ebullition from becoming too violent; the specific gravity of the distilled acid should be 1·845. Let it be kept in well-closed vessels;" D.—"If commercial sulphuric acid contain nitrous acid, heat f℥viij. of it with between gr. x. and gr. xv. of sugar, at a temperature not quite sufficient to boil the acid, until the dark colour at first occasioned shall nearly, or altogether disappear. This process removes nitrous acid. Other impurities may be removed by distillation; which on the small scale is easily managed by boiling the acid with a few platinum chips, in a glass retort, by means of a sand-bath or gas-flame—rejecting the first half-ounce. The density of it is 1·845;" E.

Physical Properties.—It is a heavy, oily-looking liquid, transparent, colourless when pure (the commercial acid generally has a brownish-yellow tinge,) inodorous, with an intensely acid, burning taste; when much diluted with water, the taste is merely styptic.

Chemical Properties.—It is composed of one equivalent of sulphuric acid ($SO^3$), and one of water; it boils at 620°, and freezes at—29°. It has a great affinity for water, which it absorbs from the atmosphere; during its combination with water, great heat is evolved, a mixture of 4 parts by weight of strong acid with one of water, raises the temperature to near 300°. Sulphuric acid is one of the most powerful acids of chemistry, supplanting nearly all others from their combinations. It chars and destroys most animal and vegetable substances. Its best characteristic is the heavy white precipitate insoluble in either acids or alkalies, which it produces with solution of the muriate or nitrate of baryta.

*Adulterations.*—If the acid contain water, it will not be of the prescribed density. The impurities usually present in commercial sulphuric acid, are sulphate of lead, nitrous acid, and oxide of arsenic. Dilution with distilled water precipitates the white sulphate of lead, if it be present; the smallest trace of nitrous acid may be detected, by gently pouring over the specimen to be examined a solution of the protosulphate of iron, if nitrous acid be contained in it, a deep-red colour will be produced at the line of contact. The arsenic adulteration can be easily detected, by adding the diluted acid to pure zinc in *Marsh's apparatus*, and proceeding as for that substance, (See, *Arsenic*); or by passing a stream of sulphuretted-hydrogen through the dilute acid, when a yellow sulphuret of arsenic will be formed.

Therapeutical Effects.—Sulphuric acid is a most powerful corrosive poison, destroying the animal tissues, wherever it comes in contact with them. Properly diluted it is an excellent tonic astringent, and is employed with very beneficial results in all forms of passive hemorrhages, and to check excessive discharges when they are dependant on debility:—Thus, it is used with much advantage in hemoptysis, in epistaxis, in slight but protracted bleedings from the uterus, the stomach, or intestines, and in the colliquative sweating and diarrhœa of hectic. In calculous affections with phosphatic deposits, dilute sulphuric acid is administered with much advantage; and in painters' colic it is very generally employed with benefit, both as a prophylactic of the disease, and as a remedy when the attack is present. As a topical astringent sulphuric acid largely diluted was at one time much used to foul and indolent ulcerations of the mouth and fauces, but in consequence of its liability to injure the teeth, it is scarcely ever employed in

such cases at present. The internal use of this acid, if continued for any length of time, is apt to derange the digestive functions causing cardialgia, griping pains and emaciation.

Dose and Mode of Administration.—In prescribing any of the dilute mineral acids, it is generally recommended that the patient be directed to suck them through a quill, in order to prevent them from producing any injurious effect on the teeth; but my friend Mr. L'Estrange of this city has suggested to me a much more efficacious plan, namely, that a small bit of butter should be rubbed over the teeth, just before the dose is to be taken. This method is of course equally applicable, where other medicines, as many preparations of iron, iodine, &c. which injure the teeth are administered.—*Acidum sulphuricum dilutum*, D. L. E. (Sulphuric acid (pure, D.), one part (fʒiss., L. fʒj., E.); distilled water, 7 parts (fʒxivss., L. fʒxiij., E.); add the acid to the water gradually and mix. Sp. gr. 1·084, D. 1·090, E.). Dose, min. x. to min xxx. in fʒi. to fʒij. of some mild liquid; it is usually given in the acid infusion of roses. It must be remembered that the Dublin preparation is much stronger than that of either London or Edinburgh.—*Acidum sulphuricum aromaticum*, D.E. (Sulphuric acid (commercial, E.), *by weight* ʒvj. (fʒiiiss., E.); rectified spirit, *by measure* ℔ij. (Oiss., E.); add the acid gradually to the spirit, digest the mixture with a very gentle heat for three days in a close vessel; then add cinnamon bruised, ʒiss., and ginger, bruised, ʒj.; digest for six days more, and "filter through paper placed in a glass funnel," D.—"strain; or the mixed powders may be moistened with a little of the acid spirit, and after 12 hours the powders may be exhausted by percolation with the rest of the spirit," E.). This preparation is used in the same cases as the dilute sulphuric acid, for which it forms an agreeable substitute. Dose, min. x. to min. xx. in a wine-glass of water.—*Unguentum acidi sulphurici*, D. (Sulphuric acid, ʒi.; prepared hog's-lard, ʒi.; mix). Not much employed at present, said to be useful in scabies.

Incompatibles.—The alkalies, and their carbonates; most metals, and their oxides; some of the earths, and their carbonates; acetate of lead; chloride of calcium; muriate of baryta; nitrates; alcohol and consequently all tinctures; organic substances; essential oils; and the vegetable astringent infusions or decoctions.

In poisoning with this acid, the best antidotes are the alkaline bicarbonates, or carbonate of magnesia. Chalk and magnesia, though generally recommended, should not be employed, as with the former sulphate of lime is formed, and the combination of sulphuric acid with the latter produces a considerable degree of heat. External parts burned with it should be washed with soap and water.

Alumen; Aluminæ et potassæ sulphas, D. L. Alumen, E. *Alum; Sulphate of alumina and potash.*

Physical Properties.—As met with in the shops, alum is in transparent, colourless, crystalline masses, void of odour, having a sweetish astringent taste. Sp. gr. 1·700. By solution and crystallization it may be readily obtained in regular octahedres.

Chemical Properties.—It is composed of one eq. of sulphate of potash, one of tersulphate of alumina, and 24 of water ($KO, SO^3 + Al^2O^3, 3\,SO^3 + 24\,HO$). The crystals effloresce slightly in the air; heated they fuse in their water of crystallization, all of which they part with, and are converted into a light porous mass, known as *dried* or *burned alum*. Alum dissolves in 18·4 parts of cold water, and in 0·75 parts of boiling water: the solution is decidedly acid. By a red heat alum is deprived of most of its sulphuric acid, and converted into a mixture of sulphate of potash and pure alumina.

Therapeutical Effects.—Alum is a powerful astringent, and as such is employed with benefit in the treatment of many diseases, both as a general and topical remedy. Administered internally, it is found useful in the treatment of chronic diarrhœa and dysentery, in atonic mucous discharges, in passive hemorrhages, in the colliquative sweating of hectic, &c. In *pyrosis* given in large doses frequently repeated, it has proved very successful in the hands of many practitioners; and it has also, when given in full doses combined with opium, been found to be an excellent remedy in the treatment of *colica pictonum*. As a topical astringent, it is employed to arrest bleeding from minute vessels, as in epistaxis, in menorrhagia, in hemorrhage from leech bites, &c. *Dried alum* in fine powder is an excellent application in the early stages of the inflammatory sore throat of scarlatina, measles and small-pox, and in diphtheritis; it is best applied by insufflation, that is by placing a small portion of it in an open glass-tube, and blowing it into the throat. Dissolved in water alum is also used with much advantage, as a gargle in relaxation of the uvula and tonsils, in chronic ulcerations of the mouth and fauces, and in excessive salivation; as a collyrium, in chronic ophthalmia; and as an injection in gleet and fluor albus.

Dose and Mode of Administration.—*Internally*, gr. x. to ʒss. in powder, or made into pill with extract of liquorice, or it may be given in solution in some aromatic water.—*Pulvis aluminis comp.*, E. (Alum, ʒiv.; kino, ʒi.; mix them and reduce them to fine powder). A useful astringent in chronic diarrhœa, and in passive hemorrhages from the stomach and bowels; Dose, gr. xij. to ℈ij. It has been also applied externally to flabby ill-conditioned ulcers.—*Alum whey*, (Alum, powdered, gr. x.; new milk, fʒij.; boil together for ten minutes, and strain to separate the curd). Sufficient for one dose.—*Externally*, gr. xxx. to ʒij. dissolved in Oi. of water.—*Cataplasma aluminis*, D. (Agitate together, so as to form a coagulum, the whites of two eggs and a drachm of alum). In chronic or purulent ophthalmia, applied to the eye between two folds of linen.—*Alumen siccatum*, D.—*exsiccatum*, L. E. (Take any convenient quantity of alum; liquefy it in an earthen (or iron, E.) vessel over the fire, increase the heat till the ebullition has ceased; then reduce it to powder). For external use only.—*Liquor aluminis comp.*, L. (Alum; and sulphate of zinc, of each, ʒi; boiling water, Oiij.; dissolve the salts together in the water, and strain). An excellent astringent lotion, collyrium, or injection.

Incompatibles.—Alkalies, and their carbonates; lime and magnesia, and their carbonates; tartrate of potash; acetate of lead; salts of

mercury; vegetable extractive matter; and substances containing tannin.

Catechu, D. L. E. *Catechu; Extract of the wood of Acacia Catechu,* D. L.—*Extract of the wood of Acacia Catechu,—of the kernels of Areca Catechu,—and of the leaves of Uncaria Gambir,—probably too from other plants,* E. *Acacia Catechu* is a native of several parts of the East Indies; it belongs to the Natural family *Leguminosæ (Fabaceæ,* Lindley), and to the Linnæan class and order *Polygamia Monœcia. Areca Catechu* inhabits most of the Indian continent and islands; it belongs to the Natural family *Palmaceæ,* and to the Linnæan class and order *Monœcia Hexandria. Uncaria Gambir* is a native of many of the islands of the Indian Archipelago; it is placed in the Natural family *Cinchonaceæ,* and in the Linnæan class and order *Pentandria Monogynia.*

Botanical Characters.—*Acacia Catechu;* Stem, 15-20 feet high, with a brown, scabrous bark, and a hard, heavy wood, dark-red in the centre; Flowers, numerous, pale-yellow; Legumes, 8 seeded.—*Areca Catechu;* a beautiful palm between 40 and 50 feet high; Leaves, 15 feet in length, crowded at the extremity of the stem; Flowers in numerous clusters, appearing from among the leaves; Fruit, a handsome orange-coloured ovoid drupe. *Uncaria Gambir;* a stout scandent shrub; Leaves, ovato-lanceolate; Flowers, green and pink, in loose heads, on opposite axillary peduncles.

Preparation.—From the Acacia, catechu is obtained by boiling the red heart-wood cut into chips for some hours in water, until the decoction is sufficiently concentrated to become on cooling a tough extract, it is then divided into small masses, and dried slowly in the shade.—In the interior of the fruit of the *Catechu palm,* is contained a roundish conical nut, marbled internally brown with whitish veins, commonly known by the name of *betel nut,* and which, with lime and the leaves of the *Piper betel,* constitutes the celebrated masticatory of the East, called *Betel.* These nuts contain a large quantity of tannin, and a decoction of them concentrated and dried forms some of the inferior catechus of commerce.—The leaves of the *Uncaria Gambir,* are boiled in water immediately after they are pulled from the tree, the decoction concentrated, and run into square or parallelopiped moulds, to constitute the catechu in cubes of commerce.

Physical Properties.—A great many varieties of catechu occur in commerce, but we shall confine our attention to the two sorts most usually met with in druggists' shops, the remainder being chiefly employed for tanning. 1st.—*Brown Catechu in irregular masses;* this is the produce of the Acacia Catechu, it occurs in irregular-shaped, roundish masses, generally covered with rice husks, weighing from three or four ounces to a pound or more each, of a chocolate-brown colour, very friable, with an astringent bitter taste. 2nd.—*Catechu in cubes (Gambeer; Terra Japonica; Cubical resinous catechu);* This variety is obtained from the Uncaria Gambir; it occurs in cubes, whose faces are about an inch square; it is of a yellowish-brown colour, with a paler, dull, earthy fracture; is void of odour, but has a very astringent taste, becoming feebly sweetish.

Chemical Properties.—The different varieties of catechu consist principally of *tannin,* and a peculiar acid, which has been named *catechuic acid.* Their astringency depends on the tannin, of which the

finer qualities contain 55 per cent, while some inferior specimens do not yield more than 28 per cent. Catechu does not dissolve completely in boiling water, but when of good quality is almost entirely soluble in alcohol. The watery infusion is of a dark reddish-brown colour, and reddens litmus paper faintly; it gives a blackish precipitate with sulphate of iron.

*Adulterations.*—The varieties of catechu are so numerous, so different in quality, and many of them are so very impure, that the only satisfactory test of their relative value is to ascertain the quantity of tannin which is contained in them. This may be readily done, by acting on a given weight with ether, evaporating the ethereal solution to dryness, treating the extract thus obtained with cold water, and again evaporating; when the proportion soluble in both ether and water, should amount at least to from 38 to 40 per cent of the specimen.

Therapeutical Effects.—Catechu is a simple, but very efficacious astringent, and is consequently in general use. It may be administered in all cases of increased mucous discharges, where there is no inflammation present:—Thus it is employed with benefit, in chronic cystirrhœa, in leucorrhœa, in gleet, in chronic catarrh, and in old standing cases of diarrhœa and dysentery, in which it is usually given in combination with opiates. It is also an excellent remedy in passive hemorrhages from the intestines, or uterus; as a topical astringent, it is one of the most useful applications in relaxation of the uvula and tonsils, in slight ulcerations of the mouth, and in chaps or excoriations of the nipple in nurses; for the latter purpose, the tincture should be applied with a camel's-hair pencil repeatedly in the course of the day. Public speakers and singers employ catechu lozenges with much benefit as a preventive of hoarseness, and as a remedy for it when it exists.

Dose and Mode of Administration.—Gr. x. to ʒj. in powder with sugar, or made into a bolus with honey or treacle.—*Infusum Catechu*, E. *Infusum Catechu comp.*, D. L. (Extract of catechu, (powdered, L.), ʒiiss. (ʒvi., L.); cinnamon, bruised, ʒss. (ʒi., L.); boiling water, (distilled, L.), ℔ss. (Oj., L.); digest (macerate L.), for an hour in a covered vessel, and strain (through linen, D.); D. L.—"Catechu powdered, ʒvj.; cinnamon powdered, ʒi.; syrup, fʒiij.; boiling water, fʒxvij.; infuse the catechu and cinnamon with the water for two hours, strain through linen or calico, and add the syrup," E.). Dose, fʒi. to fʒij. two or three times a day, or the same quantity may be added to an astringent enema.—*Tinctura Catechu*, D. L. E. (Catechu, (in moderately fine powder, E.), ʒiij. (ʒiiiss., L. E.); cinnamon, bruised, ʒij. (ʒiiss., L. E.); proof spirit, *by measure* ℔ij. (Oij., L. E.); macerate (digest, E.) for 7 (14, L.) days, (strain and express strongly, E), and filter. "This tincture may also be prepared by the process of percolation, the mixed powders being put into the percolator, without being previously moistened with the spirit," E.); Dose, fʒi. to fʒij.; usually employed as an adjunct to astringent mixtures in diarrhœa.—*Electuarium Catechu*, E. *Electuarium Catechu comp.*, D. (Catechu, ʒiv.; cinnamon, ʒij. (ʒi, E.); kino, ʒiij. (ʒiv., E.); (nutmeg, ʒi., E.); reduce these to powder; and add of opium, diffused in a little sherry, ʒiss.; and syrup of ginger, boiled down to the consistency of honey, ℔ij¼. (Oiss., E.);

pulverise the solids; mix the opium and syrup; add the powder, and beat them thoroughly into a uniform mass). A useful astringent in chronic diarrhœa and dysentery; Dose, ℈i. to ʒij. One ounce contains gr. iiss. (gr. ij¼; E.) of opium.—*Catechu lozenges*, P. (Catechu, 1 part; sugar, 4 parts; mucilage of gum-tragacanth sufficient to form into a proper mass, divide into lozenges of gr. x. each).

Incompatibles.—The alkalies; lime water, salts of iron, and of lead; gelatine; and all vegetable substances, whose active principle is an alkaloid, as an insoluble tannate of the alkaloid will be formed; Christison, however, states that it is probable that the alkaloidal tannates are sufficiently soluble in the acids of the gastric juice.

Creasoton, L. Creasotum, E.—*An oxyhydrocarburet, prepared from pyroxylic oil*, (Lond.).—*Creasote*, (Edin.). Creasote exists in pyroligneous acid, in wood smoke, and in wood tar; from the latter of which it is usually prepared. Different processes are followed by different manufacturers for the preparation of creasote; and as they are very complicated, and can only be successfully executed on the large scale, I must refer to some of the modern works on chemistry for an account of them.

Physical Properties.—Pure creasote is a colourless, transparent, oily-looking liquid, having a smoky odour, and a bitter, acrid, somewhat caustic taste. Its Sp. gr. at 68°F. is 1·037 (Reichenbach); 1·066 (Edin. Phar.)

Chemical Properties.—It is a compound of $C^7H^9O$ (Ettling). It boils at a temperature of 397.4°; and is not congealed at —16·6°; at a temperature a little above its boiling point it is decomposed; it is inflammable, and burns with a very sooty flame. Creasote forms two different compounds with cold water; one, a solution of 1·25 parts of creasote in 100 parts of water; the other, a solution of 10 parts of water in 100 of creasote. It mixes with acetic acid in all proportions, as also with alcohol, and ether. It coagulates albumen; dissolves most resins; and has a powerful preservative property with respect to animal substances, whence its name is derived, (κρεας σωζω). It is neutral.

*Adulterations.*—Creasote from being badly prepared frequently contains a number of peculiar principles which exist in tar, and it is commonly adulterated with the fixed and volatile oils; its purity may be known, by its being colourless, by its complete solubility in acetic acid, by its density not being too high, and "by its leaving no translucent stain on white filtering paper, when dropped on it, and exposed to a temperature of about 212° for ten minutes." *Ed. Ph.*

Therapeutical Effects.—As an astringent creasote is chiefly employed externally, but it is also used as an internal remedy with much benefit in some diseases. Its principal uses are, as a styptic to arrest hemorrhage, which it does very effectually when the bleeding proceeds from small vessels, as in some forms of hematemesis, and of bleeding from the intestines, in cuts or abrasions, from leech bites, or from ulcerated surfaces; in mucous diarrhœa; as an application to indolent ulcers especially when accompanied with a sanious discharge, to chronic venereal or phagedenic ulceration, to ulcerated chilblains, in chronic skin diseases, particularly those of the scalp; and as an injection in leucorrhœa.

Dose and Mode of Administration.—Min j. to min. ij. gradually increased to min v, dissolved in at least an ounce or an ounce and a half of water; and frequently repeated. In the external application of creasote in the form of wash, its little solubility in water should be remembered, for if an excess be present it will float on the surface, and being thus directly applied, will produce an effect very different from what was intended. For a wash, min. ij. to min vj. may be dissolved in f℥i. of water; or the following ointment may be employed.—*Unguentum Creasoti*, L. E. (Creasote, f℥ss. (f℥i., E.); axunge, ℥i. (℥iij., E.); "rub and mix them," L. "Melt the axunge, add the creasote, stir them briskly, and continue to do so as the mixture concretes on cooling," E.).

Creta, *Chalk*, (described in the division *Antacids)*, is employed as an astringent in the various forms of diarrhœa; its beneficial effects as such depend principally upon its antacid properties, (see p. 6). Chalk mixture is very generally used as a vehicle for more active astringents. The following preparation is admirably adapted for the simpler forms of diarhœa unattended with inflammation:—*Pulvis cretæ comp. cum opio*, D. L. *Pulvis cretæ opiatus*, E. (Compound chalk powder, ℥viss. (℥vj. E.); hard opium, powdered, ℈iv.; mix them). Dose, for adults, gr. xx. to gr. xl.; for children, gr. ij. to gr. x. Forty grains (D. L.); thirty-seven (E.); of this powder contain one grain of opium.

### Cupri sulphas, D. L. E. *Sulphate of copper. Blue vitriol.*

Preparation.—It is an article of the Materia Medica in the three British Pharmacopœias. On the large scale, it is usually prepared by roasting copper pyrites, *sulphuret of copper*, exposing it to the air and to moisture until it is oxidated, dissolving out the sulphate thus formed, evaporating and crystallizing.

Physical Properties.—This salt usually occurs in fragments of large crystals, of the oblique rhombic prism series, semitransparent; of a beautiful blue colour; without odour, but having a styptic, metallic taste. Sp. gr. 2·2.

Chemical Properties.—The crystals are composed of 1 eq. of protoxide of copper, 1 of sulphuric acid, and 5 of water (CuO, $SO^3$, HO + 4 HO). They effloresce slightly in dry air; at a temperature of 212°, they part with 4 eq. of water; at 400° they become anhydrous and white; and at a red heat they fuse and lose part of their acid. Sulphate of copper is soluble in 4 parts of cold, and in 2 of boiling water; it is insoluble in alcohol. It has an acid reaction.

*Adulterations.*—Sulphate of copper is very often adulterated with sulphate of iron; I have seen some specimens which contained nearly 50 per cent of that salt. In the crystalline state, the fraud may be readily detected with the naked eye. The best chemical test is the addition of ammonia in excess to a solution of the suspected salt, which has been previously boiled with a little nitric acid; should any iron be present, the precipitate at first thrown down will not be completely redissolved.

Therapeutical Effects.—Sulphate of copper in large doses, if it be not rejected by vomiting, is a powerful irritant poison, producing in-

flammation of the parts with which it comes in contact, and acting remotely on the nervous system, causing death with coma and convulsions. In small but repeated doses it operates as a tonic and astringent; with the latter intention, it is only employed in chronic diarrhœa and dysentery, in which it will often succeed in checking the discharges, when vegetable astringents completely fail. Externally a solution of sulphate of copper is used with benefit as a stimulating astringent to indolent and ill-conditioned ulcers accompanied with excessive discharge, as a collyrium in chronic ophthalmia, and as an injection in chronic mucous discharges from the urethra, or vagina. In the early stages of gonorrhœa, if the inflammation does not run very high, a weak solution, gr. i. to f℥i. of water, injected three or four times a day will often succeed in checking the disease.

Dose and Mode of Administration.—Gr. ss. to gr. ij. or gr. iij. made into pill with conserve of roses. For a lotion, gr. ij. to gr. x. in f℥i. of water. For an injection, gr. i. to gr. iv. to f℥i. of water.

Incompatibles.—The alkalies and their carbonates; lime water; acetate of lead; nitrate of silver; corrosive sublimate; and all the salts of iron except the sulphate; and most astringent vegetables.

In poisoning with this salt, the best antidote is albumen, as the whites of eggs; and in their absence, wheaten flour. Sugar has also been found beneficial, and iron filings have been recently proposed, so as to precipitate the copper in the metallic state.

### Ferri pernitras.—*Pernitrate of iron; Persesquinitrate of iron.*

**Preparation.—Nitric acid; and distilled water, of each, equal parts; clean iron cut into small fragments, a sufficiency; mix the acid with the water in a capacious glass vessel; add the iron gradually, and in small quantities at a time, as long as any is dissolved. Preserve the solution in well-stoppered glass bottles.**

Physical Properties.—A transparent liquid, of a fine orange-brown colour; with a weak nitric acid odour, and an acid, styptic taste.

Chemical Properties.—From this solution, large transparent, colourless crystals may be procured; according to Pelouze, their composition is 2 atoms of peroxide of iron ($Fe^2$ $O^3$), 3 of nitric acid, and $1\frac{1}{2}$ of water. If kept in a bottle not quite filled, or if exposed to heat, the solution is decomposed, peroxide of iron thrown down and nitrous acid evolved; in which state it is unfit for medical use.

Therapeutical Effects.—Solution of the pernitrate of iron is an admirable astringent, possessing also tonic properties. It will be found particularly useful in chronic cases of mucous diarrhœa, where there is much emaciation and loss of appetite. In such cases I have derived much benefit from its employment after many other remedies had failed. My friend Dr. Montgomery of this city, informs me that he has used it extensively in the treatment of mucous discharges from the vagina, and that in such cases, he considers it the best of the ferruginous preparations.

Dose and Mode of Administration.—Min. xx. to min. xxx. for

adults; min. v. to min. xv. for children. It is best administered in water, sweetened with *simple* syrup.

Incompatibles.—All astringent vegetable infusions, decoctions, or syrups.

Ferri sulphas, D. L. E.—*Sulphate of protoxide of iron; Green-vitriol.*

Preparation.—*Dub.*—"Iron-wire, 4 parts; sulphuric acid, 7 parts; water, 60 parts; dissolve the metal with the aid of heat, and filter the liquor through paper. Then, after due evaporation, set aside, that crystals may form by slow cooling." *Lond.*—"Iron-filings, ℥viij.; sulphuric acid; ℥xiv.; water, Oiv.; mix the acid with the water, and add the iron; then apply heat, and when bubbles have ceased to escape, strain the liquor, and set it aside that crystals may be formed; evaporate the liquor poured off, that it may again yield crystals. Dry them all."—An article of the Materia Medica in the Edinburgh Pharmacopœia.

Physical Properties.—Commonly met with in large transparent, pale bluish-green crystals, the primary form of which is the oblique rhombic prism. They are inodorous, but have an acid, disagreeable, styptic taste. Sp. gr. 1·82.

Chemical Properties.—The crystals are composed of 1 eq. of protoxide of iron, 1 of sulphuric acid, and 7 of water, (Fe O, $SO^3$, HO + 6 HO). They effloresce slightly in dry air, but, if moisture be present, they attract oxygen and become covered with a brownish-yellow crust of the sesquioxide of iron. Heated they fuse in their water of crystallization, 6 eq. of which they part with at a temperature of 238°; at a red heat they are decomposed, the sulphuric acid driven off and the red peroxide, *colcothar*, left. Sulphate of iron requires for its solution once and a half its weight of cold water and a third of its weight of boiling water. It is insoluble in alcohol. The solution reddens litmus paper.

*Adulterations.*—The presence of the sesquioxide, which is very common in the commercial salt, is known by the yellowish-brown colour of the crystals. It is often contaminated with copper, which may be readily detected by immersing a polished plate of iron in a solution of the salt, on which the copper will be deposited if any be present.

Therapeutical Effects.—Sulphate of iron in doses of ℥ij. and upwards, if it be not rejected by vomiting, is an irritant poison; taken in small doses frequently repeated, it acts as a tonic and astringent; with the latter intention it is employed in passive hemorrhages, in chronic diarrhœa and dysentery, and in atonic mucous discharges. As a topical remedy it is used to check bleeding from small blood-vessels, and in solution as an astringent lotion or injection, to ulcers, in chronic ophthalmia, and in chronic discharges from mucous membranes as in leucorrhœa and gleet. On the continent, it is also very generally employed as a local application in erysipelas, and it is stated, with most excellent effect. Velpeau was the first who recommended the use of sulphate of iron in this disease; he employed it both in solution and in the form of ointment. The former, which consists of one part of the salt dissolved in fifteen parts of water, he uses whenever the inflamed parts can be kept

covered with lint soaked in it; but when this can not be conveniently effected he employs an ointment composed of one part of the sulphate, and three or four parts of prepared lard. I have used a weaker ointment than this, ʒss. to ʒj. of lard, with very great benefit in some severe cases of acute impetigo, after the pustules had burst.

Dose and Mode of Administration.—Gr. j. to gr. v. in pill.—*Ferri sulphas exsiccatus*, E. (Expose sulphate of iron to a moderate heat in an unglazed earthen vessel till it become white and perfectly dry). A more convenient preparation for internal use than the crystallized salt; 3 grains are equal to nearly five of the crystals; Dose, gr. ss. to gr. iij.—*Pilulæ sulphatis ferri*, E. (Dried sulphate of iron, 2 parts; extract of taraxacum, 5 parts; liquorice root powder, 3 parts; conserve of red roses, 5 parts; beat them together into a proper mass which is to be divided into five grain pills). Each pill contains ⅔ of a grain of dried sulphate of iron; Dose, one to three pills. For external use, gr. ij. to gr. x. may be dissolved in fʒi. of water.

Incompatibles.—The alkalies, and their carbonates; nitric acid; lime water; nitrate, and tartrate of potash; iodide of potassium; borax; muriate and nitrate of baryta; acetate of lead; the soaps; and all vegetable astringents.

Gallæ, D. L. E. *Galls; Gall-nuts; Excrescences (Diseased buds, L.) of Quercus infectoria.*—This tree is a native of Asia Minor; it belongs to the Natural family *Cupuliferæ (Corylaceæ* Lindley), and to the Linnæan class and order *Monœcia Polyandria*. Galls are formed on the young branches in consequence of the irritation produced by the puncture of an hymenopterous insect, the *Diplolepis Gallæ tinctorum*, which punctures the bark for the deposition of its eggs.

Physical Properties.—Galls vary in size from that of a large pea to that of a cob-nut. They are of a grayish-green colour, tuberculated on the surface, the tubercles and intervening spaces smooth; hollow, and of a yellowish-white colour internally. They have an intensely astringent taste, but no odour. Galls are imported principally from Constantinople and Smyrna, but some are brought from the East Indies. In commerce, two kinds of galls are commonly met with, blue or green galls, and white galls; the former are gathered before the escape of the insect, and are the best; the latter are perforated with a small circular hole through which the insect has escaped, are larger, of a paler colour, but are much inferior in astringency.

Chemical Properties.—Galls are composed of about 26 per cent of tannin with a trace of gallic acid, extractive matter, a compound of pectic acid and tannin insoluble in cold water, tannates and gallates of potash and of lime *(Berzelius)*. They yield their astringent property to water, proof spirit, alcohol, and ether. Of these, water is the best solvent; the solution gives a curdy precipitate with solution of gelatine *(tannate of gelatine*, the basis of leather), and a bluish-black precipitate with salts of the sesquioxide of iron *(tanno-gallate of iron*, the basis of ink).

Galls are not liable to adulteration in the English trade.

Therapeutical Effects.—Galls are among the most powerful vegetable astringents we possess, nevertheless they are but seldom employed internally in medicine; they may be used in passive hemorrhages, in chronic diarrhœa or dysentery, in gleet and in leucorrhœa. They are the best antidote in poisoning with tartar emetic, ipecacuanha, emetina and the vegetable alkaloids generally. Externally galls are employed as topical astringents in the milder forms of hemorrhoids, in relaxation of the uvula and tonsils, in chronic ulcerations of the mouth and fauces, and in atonic mucous discharges.

Dose and Mode of Administration.—*Internally* in powder gr. v. to ℈j.—*Infusum Gallæ,* (Galls, powdered, ʒiv.; boiling water, fʒvj.). Dose, fʒss. to fʒij.—*Tinctura Gallarum,* D. E. *Tinctura Gallæ,* L. (Powdered galls, ʒiv. (ʒv., L. ʒij., E.); proof spirit, *by measure* ℔ij. (Oij., L. Oj., E.); macerate for seven (fourteen, L.) days and filter; "or may be prepared by percolation, as tincture of capsicum," E.). Dose, fʒss. to fʒij. *Externally,* ʒij, infused in Oj. of water for a gargle, lotion or injection.—*Unguentum Gallarum,* D. (Galls, in fine powder, ℥j.; lard, ʒviij.; mix).—*Unguentum Gallæ compositum,* L.—*Gallæ et opii,* E. (Galls finely powdered, ʒij.; hard opium in powder, ʒss. (ʒi., E.); lard, ℥ij. (℥j., E.); triturate well together). The opium in the London and Edinburgh formulæ is an excellent addition to this ointment; a drachm of camphor is also often added with benefit.

Incompatibles.—The mineral acids; salts of iron and lead; sulphate of copper; nitrate of silver; carbonates of potash and of soda; lime water; tartar emetic; and infusions of cinchona, calumba, cusparia, ipecacuanha, opium, &c.

Geum urbanum, radix. D.—*Root of Geum urbanum, or Common Avens.* Indigenous; belonging to the Natural family *Rosaceæ,* and to the Linnæan class and order *Icosandria Polygynia.*

Botanical Characters.—Root of many brown fibres; Stem, 6-18 inches high, herbaceous; Leaves, green, hairy; Flowers, yellow, terminal, solitary.

Preparation.—The root should be dug up in spring, and dried with a moderate heat.

Physical Properties.—Geum root consists of numerous small fibres proceeding from a root stalk about 2 or 3 inches in length; it is dark brown externally, reddish internally; has an aromatic clove-like odour in the recent state, which is lost by drying; its taste is aromatic and astringent.

Chemical Properties.—The principal constituents of the root are tannin, volatile oil, resin, and a trace of gallic acid.

Therapeutical Effects.—As an astringent, this root was formerly much employed in various diseases, and still bears a high character in many parts of the Continent; in this country, though retained in the Dublin Pharmacopœia, it is only used as a domestic remedy.

Dose and Mode of Administration.—In powder, ʒss. to ʒi.—

*Decoctum Gei radicis,* (Geum root, bruised, ʒi.; boiling water, Oi.; boil down to fʒxij.) Dose, fʒss. to fʒi.

Incompatibles.—All substances incompatible with tannin.

Hæmatoxylon, E. Hæmatoxylum, L. Hæmatoxylum campechianum, lignum, D. *Logwood; Wood of Hæmatoxylum Campechianum.*—A native of Campeachy in Central America, now naturalized in Jamaica. It belongs to the Natural family *Leguminosæ (Fabaceæ,* Lindley), and to the Linnæan class and order *Decandria Monogynia.*

**Botanical Characters.—Stem crooked, about 8 inches in diameter, and 40 or 50 feet high; Leaves large, pinnate; Flowers yellow, in racemes.**

Physical Properties.—The heart-wood of the tree which is of a dark-red colour, is alone employed, the bark and alburnum being chipped off. It is imported in billets, which are dense and hard, have a weak agreeable odour, and a sweetish astringent taste.

Chemical Properties.—Logwood contains a peculiar red, crystalline, bitter principle, which has been named *hæmatin* or *hæmatoxylin,* resin, volatile oil, some tannin, acetic acid, and various salts. *Hæmatin* is often found in the fissures of the wood, in beautiful, large, red crystals. Logwood yields its active principles to both water and alcohol; the solutions are of a fine purple colour, which is changed to violet by the alkalies; with alum, or acetate of lead, a blue precipitate is produced; a dark brown, with the salts of iron; and a reddish with gelatine. It is consequently very much employed as a dye wood.

*Adulterations.*—Various red-coloured woods are substituted for logwood, from which they may be readily distinguished, by their not possessing the same agreeable odour.

Therapeutical Effects.—Logwood is an excellent astringent in chronic diarrhœa and dysentery, for which it is peculiarly adapted, as, although it checks the excessive discharge, it does not produce constipation. It has been also used in the profuse sweating of phthisis, and in diabetes.

Dose and Mode of Administration.—*Decoctum Hæmatoxyli,* D. E. (Logwood, in fine chips, ʒiss. (ʒi., E.); cinnamon, bruised (powdered, E.), ʒj.; water, *by measure* ℔ij. (Oi., E.); Boil the logwood in the water down to one half, adding the cinnamon towards the close; and strain). Dose, fʒi. to fʒij.—*Extractum Hæmatoxyli,* D. L. E. ("Prepared as the simpler extracts," D.—"Logwood, powdered (in chips, E.), ℔iiss. (℔j. E.); boiling water, (distilled, L.), cong. ij. (cong. i., E.), macerate for 24 hours, then boil down to cong. j. (Oiv. E.), strain while hot, and evaporate in the water-bath, (vapour-bath, E.), to a proper consistence"). Not much used; it becomes so hard by keeping, that pills made of it pass through the bowels unchanged. Dose, gr. x. to gr. xxx.

Incompatibles.—The mineral acids; acetic acid; lime water; tartar emetic; sulphates and acetates.

Kino, D. L. E. *Kino; Extract of Pterocarpus erinaceus*, L. *Concrete exudation of Pterocarpus erinaceus, and of other undetermined genera and species*, E. Various substances have been known in commcommerce and described as kino; in consequence of which, both the botanical source and the part of the world from whence it was obtained, were for a long time wrapped in much obscurity. In the present day nearly all that is imported is brought from Bombay, a very small quantity only being obtained from the coast of Africa, from whence, however, it was originally altogether procured. The former, East India Kino, is the product of the Pterocarpus marsupium, a native of the Malabar coast, belonging to the Natural family *Leguminosæ (Fabaceæ*, Lindley), and to the Linnæan class and order *Diadelphia Decandria*. The latter, African Kino, is obtained from the Pterocarpus erinaceus, a native of Gambia and Senegal. Botany Bay Kino, also sometimes met with, is the inspissated juice of the Eucalyptus resinefera, a native of Australia and Van Dieman's Land; belonging to the Natural family *Myrtaceæ*.

Botanical Characters.—*Pterocarpus marsupium.* A lofty tree, with the outer coat of the bark brown, the inner red, fibrous and astringent; Leaves, bifarious, alternate, leaflets, 5-7 alternate, elliptic, emarginate; Panicles, terminal; Flowers, white, with a yellow tinge; Legumes, long-stalked; Seed, solitary, kidney-shaped.—*Pterocarpus erinaceus.* Leaflets, 11-15 alternate, ovate, oblong, obtuse or sub-emarginate; Flowers, yellow; Legumen, orbicular, membranous, undulate at the margin.

Preparation.—"East Indian Kino is procured when the tree is in blossom by making longitudinal incisions in the bark round the trunk of the tree so as to let the gum ooze down into a receiver, formed of a broad leaf, so placed and fixed in the bark as to prevent the gum from falling on the ground. From the leaf it is made to run into a receptacle placed under the leaf to receive the gum. When this receptacle is filled, it is removed, the gum is dried in the sun until it crumbles, and then filled into wooden boxes for exportation." (Dr. Forbes Royle, Pharm. Journal, vol. v. p. 495). African Kino is procured from incisions made into the trunk and branches of the tree, whence the juice exudes, and gradually concretes into brittle tears. Botany Bay Kino is obtained in a similar manner.

Physical Properties.—Kino occurs in the form of small angular fragments or tears, none of them larger than a pea, opaque, glistening, and of a reddish-black colour. They are very brittle; when chewed they adhere to the teeth, and give the saliva a blood-red colour. They are void of odour, but have an intensely astringent taste.

Chemical Properties.—Kino is composed of 74 per cent of tannin and a peculiar extractive containing catechuic acid, 24 of red gum, and 1 of insoluble matter. It is only very partially soluble in cold or boiling water; but alcohol dissolves nearly two-thirds of it, and is therefore the best menstruum for its administration in medicine.

*Adulterations.*—Other astringent substances, which bear a general resemblance to Kino, but are of inferior quality, are frequently substituted for it in commerce; none of them, however, have the same glistening, reddish-black colour, which is so well seen in the smaller fragments of Kino; the sophistication, therefore, may be readily detected by the eye. By employing the same tests as for catechu (see p. 42), the exact amount of tannin contained in Kino may be readily ascertained.

THERAPEUTICAL EFFECTS.—Kino is an admirable astringent, possessing nearly similar properties to catechu, and may be employed in the same diseases. It is generally supposed to be better adapted for menorrhagia and leucorrhœa; and as it is more tonic, owing to the extractive which it contains, it should be preferred where great debility exists.

DOSE AND MODE OF ADMINISTRATION.—In powder, gr. x. to ʒss.—*Pulvis Kino compositus*, D. L. (Kino, ʒxv.; cinnamon, ʒss.; hard opium, ʒi.; rub separately to fine powder, and mix.) An excellent astringent in chronic diarrhœa and dysentery; it has been also highly praised in pyrosis; gr. xx. contain gr. i. of opium; Dose, gr. x. to gr. xxx.—*Tinctura Kino*, D. L. E. (Kino, bruised (in (moderately fine, E.) powder, L. E.), ʒiij. (ʒiiiss., L. E.); proof (rectified, L. E.) spirit, *by measure* ℔ij. (Oij. L. E.); macerate (digest, E.) for 7 (14, L.) days, and filter. "This tincture cannot be conveniently prepared by percolation," E.) Dose, fʒj. to fʒij. Tincture of Kino when long kept is often converted into an insoluble gelatinous mass, no satisfactory reason has been hitherto assigned for this change taking place. It is best prevented by keeping the tincture in small bottles completely filled, so as to exclude the atmospheric air. Notwithstanding the assertion of the Ed. Ph., it may be readily prepared by percolation, by previously mixing the kino with equal parts of fine white sand.

INCOMPATIBLES.—The mineral acids; carbonates of the alkalies; sulphate of iron; nitrate of silver; acetate of lead; and gelatine.

KRAMERIA, L. E. KRAMERIA TRIANDRA, RADIX ET EXTRACTUM, D. *Rhatany; The root (and extract, D.) of Krameria triandra.* A native of Peru; belonging to the Natural family *Polygalaceæ*, and to the Linnæan class and order *Tetrandria Monogynia.*

BOTANICAL CHARACTERS.—Stem, shrubby, procumbent; Leaves, villous-silky, oblong, sessile; Flowers, solitary, reddish; stamens, 3, whence the specific name.

PHYSICAL PROPERTIES.—Numerous long, woody, root branches, to which the common root-stock about an inch in length is often attached; they consist of a reddish brown, smooth bark, nearly an eighth of an inch in thickness, and a yellow, hard, woody centre *(Meditullium)*; they are inodorous, the bark has an intensely astringent, somewhat bitter taste, but the woody centre is nearly tasteless.

CHEMICAL PROPERTIES.—The bark of rhatany root consists of nearly 43 per cent of tannin, a trace of gallic acid, 56 per cent of gum, extractive, and colouring matter, and a small quantity of a peculiar acid which has been named *Krameric acid.* It yields its active principles to cold water and to alcohol.

THERAPEUTICAL EFFECTS.—Rhatany root is a poweful astringent and tonic, and as such is employed with much benefit in the treatment of chronic diarrhœa and of dysentery, in passive hemorrhages, in menorrhagia, and in atonic mucous discharges. As a topical astringent, it

may be applied in the form of powder to indolent ulcers with excessive discharge, and as a styptic to arrest hemorrhage, when it proceeds from very small vessels. Rhatany root finely powdered is a constituent of most tooth powders; it reddens and consolidates the gums, and whitens the teeth.

Dose and Mode of Administration.—In powder, gr. x. to ʒss.—*Extractum Krameriæ*, D. E. (An article of the Materia Medica, D.—"Prepared in the same way as extract of liquorice," E.) Dose, gr. xx. to gr. xl.—*Infusum Krameriæ*, L. (Rhatany, ʒi.; boiling distilled water, Oi.; macerate for 4 hours in a vessel lightly covered, and strain). Dose, fʒi to fʒij. This infusion becomes quite turbid on cooling, and would be better made with cold water by the process of percolation.

Incompatibles.—All substances incompatible with tannin.

Lythrum salicaria, herba, D. *Purple Loosetrife.* An indigenous plant; belonging to the Natural family *Lythraceæ*, and to the Linnæan class and order *Dodecandria Monogynia.*

The whole of this herb possesses mildly astringent properties, it was formerly much employed in chronic diarrhœa, and dysentery, but at present it has fallen completely into disuse. Dose, ʒij. to ʒiv. of the dried herb in powder or infusion, two or three times daily.

Matico.—This substance was introduced to the notice of the profession a few years ago by Dr. Jeffreys of Liverpool. It is supposed to be the leaf of *Artanthe elongata (Piper angustifolium*, Ruiz and Pavon,) a native of Peru, belonging to the Natural family *Piperaceæ*, and to the Linnæan class and order *Diandria Trigynia.*

Properties.—The leaves as imported are attached to the stem, and the flowering spike is also often present. They have an aromatic, slightly astringent taste, and an agreeable aromatic odour, somewhat resembling that of sage. They yield their active principles to water and to alcohol. According to the analysis of Dr. Hodges, Matico consists of a bitter principle *(Maticine)*, and an aromatic volatile oil, soft resin, colouring matter, salts, chlorophylle, gummy matter, and lignin. Two kinds of the herb have been forwarded to this country, the one *green* and the other *yellow*, the latter, which appears to have been gathered when the plant was riper, is much the more active.

Therapeutical Effects.—This substance is held in high esteem as a styptic and astringent in its native country, and the trials that have been made with it since it was first introduced into England by Dr. Jeffreys, prove that it possesses both these properties. As an astringent it has been employed internally in the same cases as the other vegetable remedies of this class, over which it does not appear to possess any advantage. It is, however, chiefly as a styptic in external cases of hemorrhage, that it has been lauded; and from the numerous cases that have been published in which it has arrested bleeding from small blood-vessels,

as from leech-bites, after the ablation of nævi, from incisions, &c. There can be no doubt of its being a styptic of much power.

Dose and Mode of Administration.—In powder gr. x. to ʒss. The infusion may be prepared by infusing ʒi. of the coarsely powdered leaves in Oi. of *cold* water for two hours, frequently agitating. The dose of it, filtered, is from fʒi. to fʒij. two or three times a day. The tincture may be prepared either by maceration or percolation, the proportions are ʒij. of the herb, to fʒxvi. of spirit. Dose, fʒi. to fʒij. To arrest hemorrhage, the *under* side of the leaf is applied to the bleeding surface.

Incompatibles.—The mineral acids; the alkalies; the sesquisalts of iron; acetate of lead; and the tincture or infusion of galls.

Monesia.—Under this name, a few years since, an astringent extract was imported into France from South America; it is obtained from the bark of the *Chrysophyllum Buranhem*, a native of Brazil, belonging to the Natural family *Sapotaceæ*. The extract is brought over in large cakes which are purified by dissolving them in water, filtering and evaporating; the purified extract is in small fragments resembling kino in appearance, but it has not the peculiar ruby lustre of that substance; the taste is at first sweetish, then astringent, and the odour feebly aromatic; it dissolves readily in water, affording a dull brown, somewhat opaque solution; is partly soluble in alcohol, and only very sparingly soluble in ether. According to the analysis of M. M. Derosne and Henry, it consists of tannin, red colouring matter, glycirrhizine, a peculiar acrid principle which they have named *Monesine*, and various salts.

Like numerous other medicines when first introduced, Monesia was extravagantly lauded as a remedy possessing powerfully astringent properties; experience has however proved, that it is much inferior to either kino or catechu, and it probably may take an intermediate station between these substances, and extract of rhatany. It has been used in all cases where astringents are admissible, both externally and internally, but the disease in which it appears to have been most serviceable is chronic diarrhœa.

Dose and Mode of Administration.—In substance, gr. v. to gr. xv.—*Tinctura Monesiæ*, Donovan. (Extract of monesia, ʒi.; proof spirit, fʒixss.; water, fʒij.; mix and when the feces have subsided pour off the tincture). Dose, fʒi. to fʒij.—*Mistura Monesiæ*, (Extract of monesia, ϑij.; water, fʒviiss.; compound tincture of cardamoms, fʒss.; mix). Dose, fʒss. to fʒij. two or three times a day.

Incompatibles.—Mineral acids; salts of iron, zinc and lead; opium; and sulphate of quina.

Plumbi acetas, D. L. E. *Acetate of Lead; Sugar of Lead.*

Preparation.—*Dub.*—"Carbonate of lead *(cerusse)*, any quantity; distilled vinegar, ten times its weight; digest in a glass vessel, till the vinegar becomes sweet; pour off the liquor and add more vinegar, as long as it continues to be

sweetened; filter the liquors, and by alternate slow evaporation and cooling, obtain crystals which are to be dried in the shade." *Lond.*—"Oxide of lead rubbed to powder, ℔iv. ℥ij.; acetic acid; and distilled water, of each, Oiv.; mix the acid with the water, and add the oxide of lead to them, dissolve with a gentle heat, and strain: lastly evaporate, so as to form crystals." *Edin.*—"Pyroligneous acid, of the density 1034, Oij.; distilled water, Oj.; litharge, ℥xiv.; mix the acid and water, add the litharge, dissolve it with the aid of a gentle heat, filter, and concentrate the solution sufficiently for crystallization on cooling."

Physical Properties.—Usually met with in irregular white masses of acicular crystals; having an acetous odour, and a sweetish, astringent taste; the crystals are right rhomboid prisms with dihedral summits; density, 2·345.

Chemical Properties.—Acetate of lead consists of 1 eq. of protoxide of lead, 1 of acetic acid, and 3 of water (Pb O ($C^4H^3O^3$) + 3 HO). It effloresces slowly by exposure to the air, losing part of its acetic acid, and attracting carbonic acid, thereby becoming partially insoluble. By heat, the salt fuses in its water of crystallization which is all driven off; and if the heat be increased, decomposition takes place. It is soluble in once and a half its weight of water at 60°, in less of boiling water, and in 8 parts of alcohol. The solution reddens litmus paper.

*Adulterations.*—This salt is usually met with in commerce, sufficiently pure for medical use. In the Edinburgh Pharmacopœia, the following tests are given, by which a hundredth part of impurity may be easily detected.—"Entirely soluble in distilled water, acidulated with acetic acid: 48 grains thus dissolved are not entirely precipitated by a solution of 30 grains of phosphate of soda."

Therapeutical Effects.—Acetate of lead taken in large doses acts as an irritant, causing inflammation of the stomach and intestines, with intense pain and vomiting. In medicinal doses it operates as a sedative-astringent, and as such is employed with benefit in the treatment of disease, where the indication is to lower the circulation, and at the same time check excessive discharges. In all forms of passive hemorrhage it proves singularly serviceable; and when the bleeding is of an active character it may be beneficially employed in conjunction with antiphlogistic treatment. In the autumnal cholera of this country, acetate of lead, combined with opium, is the remedy on which most reliance is to be placed; and this combination has been highly spoken of by many practitioners for the treatment of Asiatic cholera. In chronic diarrhœa and dysentery it also proves serviceable; but for diminishing expectoration, and checking the colliquative sweating and diarrhœa of phthisis, it is much inferior to dilute sulphuric or acetic acids. As a topical remedy, a solution of this salt is employed with benefit in most forms of superficial inflammation of a phlegmonous character, in ophthalmia, in gonorrhœa, gleet, and leucorrhœa, and in cutaneous eruptions attended with surrounding inflammation. A collyrium of the acetate of lead should not be employed in any form of ophthalmia when the cornea is ulcerated, as it produces an indelible white stain which becomes imbedded in the substance of the cornea; an observation first made by Dr. Jacob of this city.

Dose and Mode of Administration.—Gr. ij. to gr. viij. in the form of pill, twice or thrice daily.—*Pilulæ plumbi opiatæ*, E. (Acetate of lead, 6 parts; opium, 1 part; conserve of red-roses, about 1 part; beat them into a proper mass, which is to be divided into four grain pills.—This pill may be made also with twice the quantity of opium). This forms a most useful astringent combination; each pill contains 3 grains of acetate of lead, and half a grain of opium; Dose, 2 or 3 pills, three times a day.—*Unguentum (Ceratum,* L.*) plumbi acetatis,* D. L. E. ("Ointment of white wax, ℔iss.; acetate of lead, ʒi.; make an ointment," D.—"Acetate of lead, powdered, ʒij.; white wax, ʒij.; olive oil, fʒviij.; dissolve the wax in fʒvij. of the oil, then to these add gradually the acetate of lead rubbed separately with the remainder of the oil, and stir with a spatula till they unite," L.—"Simple ointment, ʒxx.; acetate of lead, in fine powder, ʒi.; mix them thoroughly," E.). A soothing and astringent application to irritable ulcers, or excoriated parts.

Incompatibles.—Hard water; the mineral acids and their salts; citric, tartaric, and carbonic acids, and their salts; the alkalies; lime-water; iodide of potassium; tincture of galls; opium; albuminous liquids; and various vegetable infusions.

When an overdose of acetate of lead has been taken, sulphate or phosphate of soda, and sulphate of magnesia, are the best antidotes; their administration should be succeeded by emetics and afterwards by active purgatives, and opium.

## Plumbi carbonas, D. L. E. *Carbonate of Lead; White Lead; Cerusse.*

Preparation.—An article of the Materia Medica. On the large scale it is generally prepared, by exposing bars or plates of lead to the fumes of strong acetic, or pyroligneous acid, disengaged from the iron pots in which it is contained, by placing them in a mixture of dung and tanners' refuse. The carbonate forms on the surface of the lead, and is detached by rolling the plates under water. On the continent it is also frequently prepared, by transmitting a current of carbonic acid gas through a solution of acetate of lead.

Physical Properties.—A heavy, white, obscurely crystalline powder; sometimes met with in greyish-white, chalk-like masses; inodorous, and tasteless.

Chemical Properties.—It is composed of 1 eq. of protoxide of lead, and 1 of carbonic acid, ($PbO$, $CO^2$). Exposed to heat it parts with its carbonic acid, and is converted into the yellow oxide of lead. It is insoluble in water, but dissolves in nitric acid with effervescence.

*Adulterations.*—Carbonate of lead is very much adulterated; the impurities generally found in it are chalk, sulphate of baryta, and sulphate of lead; the two latter may be detected by their insolubility in dilute nitric acid. The presence of chalk may be discovered by dissolving the suspected specimen in dilute nitric acid, throwing down the lead from the solution by sulphuretted hydrogen, filtering, and adding solution of oxalate

of ammonia; when, if any chalk had been present, a white precipitate (oxalate of lime) will be produced.

Therapeutical Effects.—Carbonate of lead is more apt to produce lead-colic than any other of the preparations of this metal, it is consequently never used internally. Topically it acts as a sedative-astringent, and is employed in the form of ointment to promote the cicatrization of excoriated parts and slight ulcerations. Spread on leather, it is said to prove useful applied over the seat of the pain in local neuralgia.—*Unguentum plumbi carbonatis*, D. E. ("Carbonate of lead, in very fine powder, ʒij.; ointment of white wax, ℔j.; make into an ointment," D.—"Simple ointment, ʒv.; carbonate of lead, ʒi.; mix thoroughly," E.).

Plumbi diacetatis (subacetatis, D.) liquor, D. L. Plumbi diacetatis solutio, E. *Solution of Diacetate of Lead; Gowlard's extract; Extract of Saturn.*

Preparation.—*Dub.*—"Semivitrified oxide of lead, 1 part; distilled vinegar, 12 parts; boil down the mixture in a glass vessel, until 11 parts remain; set aside the liquor, and when the impurities have subsided, filter." *Lond.*—"Acetate of lead, ℔ij. ʒiij.; oxide of lead, rubbed to powder, ℔j. ʒiv.; water, Oiv.; boil them for half-an-hour frequently stirring, and when the liquor is cold, add of distilled water, as much as may be sufficient to measure with it, Ovi.; lastly strain the solution." *Edin.*—"Acetate of lead, ʒvj. ʒvi.; litharge, in fine powder, ʒiv.; water, Oiss.; boil together, stirring occasionally; when the solution is cold, add water, if necessary to make up Oiss.; and then filter. Preserve the solution in well-closed bottles."

Physical Properties.—This solution is transparent and colourless; it has a weak acetous odour, and a sweetish, astringent taste. Sp. gr. 1·118 at 68° (D.); 1·260 at 62° (L.).

Chemical Properties.—It is an aqueous solution of diacetate of lead, which salt may be obtained in a crystalline form by evaporation; crystallized diacetate of lead is composed of 1 eq. of acetic acid, 2 of protoxide of lead, and 10 of water, ($2\ PbO, (C^4H^3O^3) + 10\ HO$). Exposed to the air it deposits a white precipitate of carbonate of lead, the same effect is produced by adding a solution of carbonic acid or a carbonate.

Therapeutical Effects.—This solution is not used internally; externally, it is employed, diluted with from 20 to 40 parts of distilled water according to circumstances, in the same cases as a solution of acetate of lead; the only advantage it possesses over which is, that it does not dry up so quickly.—*Plumbi subacetatis liquor compositus*, D. *Liquor Plumbi diacetatis dilutus*, L. (Solution of subacetate (diacetate, L.) of lead, ʒi. (fʒiss., L.); distilled water, ℔i. (Oj. L.); proof spirit, ʒi. (fʒij., L.); mix); This preparation is too weak for general use.—*Ceratum Plumbi compositum*, L. (Solution of diacetate of lead, fʒiij.; wax, ʒiv.; olive oil, Oss.; camphor, ʒss.; mix the melted wax with fʒviij. of the oil, then remove them from the fire, and, when first they begin to thicken, add gradually the solution of diacetate of lead, and stir them constantly

with a spatula until they cool; lastly, mix with them the camphor dissolved in the remainder of the oil). *Gowlard's cerate;* employed as a dressing to diminish pain and irritation.

INCOMPATIBLES.—Same as for acetate of lead; solution of gum; organic matter; and soap liniment.

PLUMBI OXYDUM SEMIVITREUM, D. L. LITHARGYRUM, E. *Fused protoxide of lead; Litharge.* Though much employed in pharmacy and the arts, litharge is only used in medicine as a desiccative and astringent powder, to sprinkle over excoriated parts and superficial ulcerations. It enters into the composition of the following ointments:—*Emplastrum Lithargyri,* D. E. *Emplastrum Plumbi,* L. (Litharge, in very fine powder, ℔v. (℔vj. L. ℥v. E.); olive oil, cong. j. (f℥xij. E.); water, *by measure* ℔ij. (Oij. L. f℥iij. E.); boil together, (with a superior heat, D. over a slow fire, L.); stirring constantly, until the oil and litharge unite into the consistence of a plaster, it will be proper to add a little boiling water if it evaporate too far); *Diachylon-plaster;* It is used for retaining the edges of fresh wounds in contact, and as the basis of many other plasters.—*Unguentum Plumbi compositum,* L. (Prepared chalk, ʒviij.; distilled vinegar, f℥vj.; plaster of lead, ℔iij.; olive oil, Oj; melt the plaster in the oil with a slow fire; then gradually add the chalk separately mixed with the vinegar, the effervescence being finished, and stir constantly till they are cooled). Generally used as a dressing for indolent ulcers.—*Emplastrum Lithargyri cum Resina,* D. *Emplastrum Resinæ,* L. *Emplastrum Resinorum,* E. (Litharge plaster, ℔iiiss. (℔iij. L. ℥v. E.); resin (yellow, D.), ℔ss. (ʒj. E.); Add the resin powdered, to the litharge plaster melted over a slow fire, and mix). This is the *adhesive* or *sticking plaster* of the shops, commonly used for retaining the edges of wounds in contact, and for strapping ulcers.—*Emplastrum Saponis,* D. L. E. (Litharge plaster, ℔iij. (ʒiv., E.); soap, (hard, D. Castile, E.), sliced, ℔ss. (℥i.; gum-plaster, ℥ij., E.); melt the plasters, add the soap, and boil down to a proper consistence). This plaster when kept is apt to crumble to powder, to obviate which, the Edinburgh College has added the gum-plaster. It is chiefly employed to give mechanical support.—*Emplastrum Saponis compositum vel adhærens,* D. (Soap-plaster, ʒij.; plaster of litharge and resin, ℥iij.; make into a plaster, which should be melted and spread on linen). An excellent application, for the prevention of bed-sores.—*Ceratum Saponis,* L. (Soap, ℥x.; wax, ℥xiiss.; oxide of lead, powdered, ℥xv.; olive oil, Oj.; vinegar, cong. j.; boil the vinegar with the oxide of lead over a slow fire, constantly stirring them till they unite; then add the soap, and boil again in a similar manner, until all the moisture is evaporated; lastly, mix with these the wax previously dissolved in the oil). A cooling, astringent dressing.

POLYGONUM BISTORTA, RADIX, D. *Bistort; Root of Polygonum bistorta*—Indigenous; belonging to the Natural family *Polygonaceæ,* and to the Linnæan class and order *Octandria Trigynia.*

Botanical Characters.—Root, perennial. Stem, herbaceous, annual, 1-1½ foot high; Leaves, ovate, waved; Flowers, rose-coloured, in a dense, cylindrical spike.

Physical and Chemical Properties.—The root is dark brown externally, wrinkled and tortuous; reddish internally; inodorous; taste, strongly astringent. It contains a large quantity of tannin, some gallic acid, starch, and woody fibre; it yields its astringency to both water and alcohol.

Therapeutical Effects.—Bistort is among the most powerful of our indigenous astringents, nevertheless it has nearly fallen into disuse. It may be employed with benefit in chronic mucous discharges, and in passive hemorrhages.

Dose and Mode of Administration.—In powder, ʒss. to ʒi.—*Decoctum Bistortæ;* (Bistort, ʒij.; boiling water, Oiss; boil down to Oj.); Dose, fʒi. to fʒij.

Incompatibles.—All substances incompatible with tannin; and tincture of iodine.

Punica Granatum, baccæ tunica exterior, et flores, D. Granatum, L.—*The bark of the fruit (and the flowers, D.) of Punica Granatum.* This tree has been described in the division *Anthelmintics.*

Physical Properties.—The fruit-rind is met with in the shops, in arched, irregular pieces, reddish-brown and warty on the outside, yellowish within, about a line in thickness; inodorous; with a bitter, astringent taste. The flowers are reddish, and have a weak astringent taste, but no odour; they are not used at present.

Chemical Properties.—The rind of the pomegranate consists of 18·8 per cent of tannin, 17·1 of mucilage, 10·8 of extractive, 30 of lignin, and a trace of resin. It yields its astringency to both water and alcohol.

Therapeutical Effects.—Pomegranate-rind may be used as an astringent in the same cases as the other vegetable remedies of this class; but at present it is rarely employed.

Dose and Mode of Administration.—In powder, ʒss. to ʒi. *Decoctum Granati,* L. (Pomegranate-rind, ʒij.; distilled water, Oiss.; boil down to Oj. and strain). Dose, fʒss. to fʒi.

Incompatibles.—All substances incompatible with tannin.

Quercus, L. Quercus cortex, E. Quercus robur, cortex, D.—*Oak-bark; Bark of Quercus pedunculata* (Willdenow), L. E.—*of Quercus robur* (Linnæus), D.—Indigenous; belonging to the Natural family *Cupuliferæ (Corylaceæ,* Lindley), and to the Linnæan class and order *Monœcia Polyandria.*

Botanical Characters.—A large, long-lived tree; Leaves, bright green, deciduous; Flowers, *male,* yellowish; *female,* greenish tinged with brown; Fruit (acorns,) 2 or 3 on a long peduncle, surrounded at the base by the cupule.

Physical Properties.—Oak-bark is in pieces of various lengths, silvery-gray on the outside, reddish-brown within; inodorous; taste powerfully astringent; the pieces are brittle and break with a short fracture.

Chemical Properties.—It contains from 15 to 20 per cent of tannin, with some gallic acid, uncrystallizable sugar, pectin, and salts. It yields its virtues to both water and alcohol.

Therapeutical Effects.—Oak-bark is an excellent astringent; and may be employed in the treatment of chronic diarrhœa and dysentery, in alvine hemorrhages, and to check atonic mucous discharges. As a topical remedy, it is used with benefit in the form of decoction; as a gargle in relaxation of the uvula and tonsils, as an injection in fluor albus, and in prolapsus of the uterus or rectum, and as a lotion in reducible hernia to render the sac more tense.

Dose and Mode of Administration.—In powder, a bad form, ʒss. to ʒi.—*Decoctum Quercus*, D. L. E. (Oak-bark, (bruised, L.), ʒi. (ʒx., L. E.); water (distilled, L.), Oij. (℔ij., D.); boil down to Oj. (℔ij., D.), and strain). Dose, fʒi. to fʒiv. A convenient strength for a gargle, injection, or lotion.—*Extractum Quercus*, D. (Prepared as the simpler extracts). Not much used; Dose, gr. x. to ʒj.

Incompatibles.—All substances incompatible with tannin.

Rosa gallica, D. L. E. *Red-rose; Petals of Rosa gallica.*—A native of the middle and south of Europe, now cultivated extensively in our gardens. It belongs to the Natural family *Rosaceæ*, and to the Linnæan class and order *Icosandria Polygynia*.

Botanical Characters.—An undershrub, very variable in size and character owing to cultivation; the flowers are of a fine purplish-red colour, spreading.

Physical Properties.—The dried petals have a velvety appearance, an agreeable roseate odour which is developed during desiccation, and a somewhat aromatic, bitter, astringent taste. They should be gathered before the flowers expand, the white claw cut off, and then dried quickly with a stove heat.

Chemical Properties.—They consist of volatile oil, tannin, gallic acid, colouring matter, albumen, fatty matter, and some salts. They yield their properties to boiling water, affording a reddish-yellow solution, which is changed to bright red by sulphuric acid.

Therapeutical Effects.—The petals of the red-rose are very mildly astringent, and are chiefly employed in medicine on account of their colour and odour; the officinal preparations forming agreeable vehicles for the administration of more active medicines.

Dose and Mode of Administration.—*Infusum Rosæ*, E. *Infusum Rosæ acidum*, D. *Infusum Rosæ compositum*, L. ("Red-rose petals, dried and deprived of their claws, ʒss.; dilute sulphuric acid, *by measure* ʒiij.; boiling water, *by measure* ℔iij.; purified sugar, ʒiss.; first pour the water on the petals in a glass vessel; then add the acid, and digest for half an hour; strain the cooled liquor and add the sugar;" D.—"Red-

rose petals, dried, ʒiij.; dilute sulphuric acid, fʒiss.; sugar, ʒvi.; boiling distilled water, Oj.; pour the water on the rose petals in a glass vessel; then mix in the acid. Macerate for six hours, and strain the liquor, lastly add the sugar to it;" L.—The *Edinburgh College* employs the same proportions as the *London;* The petals are to be infused in the water in a covered vessel of glass or porcelain, not glazed with lead, for an hour; the acid added, the liquor strained through linen or calico, and the sugar dissolved in it). An agreeable refrigerant and mild astringent; Dose, fʒi. to fʒij. It forms one of the best vehicles for the administration of the neutral purgative salts.—*Conserva Rosæ*, D. E. *Confectio Rosæ gallicæ*, L. ("Red-rose petals, ℔j.; pure sugar, ℔iij.; bruise the petals in a stone mortar, then the sugar being added, pound them again until they are thoroughly incorporated," D. L.—"Beat the petals of Rosa gallica to a pulp, gradually adding twice their weight of sugar," E.). A very weak astringent; Dose, ʒi. to ʒij. It is principally used as a basis for pills, for which purpose, it is the best material that can be used, as it neither hardens, nor becomes candied by keeping. It should not be employed for pills containing a sesquisalt of iron, in consequence of the tannin it contains.—*Mel Rosæ*, D. L. E. (Red-rose petals, dried (and without the claws, D.), ʒiv.; boiling water, *by measure* ℔iij. (Oiiss., L. E.); honey, ℔v.; "Macerate the rose-petals in the water for six hours, then add the honey to the strained liquor, and (in a water bath, L.), boil down to the consistence of syrup (removing the scum, D.)," D. L.—"Infuse the petals in the water for six hours, strain and squeeze; let the impurities subside; pour off the clear liquor, mix with it the honey, and evaporate the whole to the consistence of syrup, removing the scum," E.). Chiefly employed as an addition to astringent gargles; Dose, ʒij. to ʒiv. *Syrupus Rosæ gallicæ*, E.—(Dried red-rose petals, ʒij.; pure sugar, ℥xx.; boiling water, Oj.; infuse the petals in the water for 12 hours, strain the liquor, and dissolve the sugar in it with the aid of heat). Principally used for imparting its fine red colour to mixtures, &c.

Incompatibles.—All substances incompatible with tannin.

Sodæ boras, D. Borax; Sodæ biboras, L. E.—*Borax; Biborate of Soda.*

Preparation.—An article of the Materia Medica; on the large scale it is prepared either by refining crude borax of commerce, *Tincal*, a natural crystalline formation, met with on the shores of some lakes in Thibet and Persia; or by saturating native boracic acid, obtained from the lagoons of Tuscany, with carbonate of soda.

Physical Properties.—Usually met with in large, translucent, colourless crystals aggregated together; the crystals are either oblique rhombic prisms, or regular octohedrons; inodorous; with a somewhat styptic alkaline taste.

Chemical Properties.—Crystallized borax consists of 1 eq. of soda, 2 of boracic acid, and 10 of water, (Na O, 2 $BO^3$ + 10 HO); but *octahedral borax* contains only 5 equivalents of water. Exposed to the air it effloresces slowly; heated it melts in its water of crystallization, which

if the heat be increased is driven off, and a light anhydrous salt, *calcined borax*, left; at a still higher temperature it fuses again, and as it cools forms a transparent solid, *glass of borax*. Borax is soluble in 8 parts of cold and in 2 of boiling water; the solution is alkaline, changing the vegetable blues to green. In solution this salt is readily recognized by adding sulphuric acid, which precipitates boracic acid in pearly crystalline scales.

THERAPEUTICAL EFFECTS.—Borax is only employed as a topical astringent, as such it is used with benefit in aphthous ulcerations of the mouth and throat, in excessive mercurial salivation, and in some forms of chronic skin disease. (See *Diuretics)*.

DOSE AND MODE OF ADMINISTRATION.—For a lotion or gargle, gr. xx. to gr. xxx. may be dissolved in f℥i. of water; or ℥i. of the following preparation in f℥v. of water.—*Mel Boracis*, D. L. E. (Borax, powdered, ℥j.; clarified honey. ℥i.; mix). The best form for applying borax to aphthous ulcerations.

INCOMPATIBLES.—The mineral acids, and most of their salts.

TANNIN.—*Tannin; Tannic acid.* A peculiar principle on which the astringent property of vegetable substances chiefly depends.

PREPARATION.—"Macerate powdered galls for 24 hours, in a closely-stopped bottle, with sufficient sulphuric ether to moisten them; express strongly with a powerful press, repeat the process until the galls are completely exhausted; recover as much as possible of the ether by distillation; and evaporate the residue to dryness over the vapour bath." LECONET.

PHYSICAL PROPERTIES.—Thus obtained, tannic acid is a yellowish-white, uncrystallizable solid, shining and pulverulent; inodorous; taste purely astringent, void of all bitterness.

CHEMICAL PROPERTIES.—Its composition is $C^{18}H^5O^9 + 3$ HO. Exposed to the air, it absorbs oxygen, and is almost entirely converted into *gallic acid* It is very soluble in water and in ether, and but moderately so in alcohol or proof spirit. It is insoluble in the fixed and volatile oils. Its solution reddens litmus paper.

THERAPEUTICAL EFFECTS.—Tannic acid is the most powerful of all vegetable astringents, and has been employed on the continent with much success in the treatment of the various forms of atonic hemorrhage, and in chronic mucous discharges; it has been found peculiarly efficacious in menorrhagia, and in the colliquative sweating and diarrhœa of hectic.

DOSE AND MODE OF ADMINISTRATION.—Gr. ss. to gr. j. or ij. in the form of pill, or dissolved in water. It has been also employed in the form of gargle, injection or lotion, in the proportion of gr. v. to gr. viij. of tannin to f℥i. of water.

INCOMPATIBLES.—The mineral acids; the alkalies, and their carbonates; lime water; acetate of lead; nitrate of silver; tartar emetic; the vegetable alkaloids; gelatin; and emulsions.

Tormentilla, D. L. E. *Tormentil; Root of Potentilla tormentilla*, L. E.—*of Tormentilla officinalis*, D. Indigenous; belonging to the Natural family *Rosaceæ*, and to the Linnæan class and order *Icosandria Polygynia*.

Tormentil-root contains about 18 per cent of tannin, and consequently is an astringent of some power, and may be used in the same cases as the other vegetable astringents. At present, however, it is scarcely ever employed, except as a domestic remedy. The dose of the powdered root is from 3ss. to 3i., three or four times a day. The decoction is a better mode of administering it:—*Decoctum Tormentillæ*, L. (Tormentil, bruised, ℥ij.; distilled water, Oiss. Boil down to Oj. and strain). Dose, f℥i. to f℥iss.. two or three times a day. It is also an excellent astringent lotion or injection.

Incompatibles.—All substances incompatible with tannin.

Uva ursi, D. L. E. *Bearberry; Leaves of Arctostaphylos uva-ursi*. L. E.—*of Arbutus uva-ursi*, D. Indigenous; belonging to the Natural family *Ericaceæ*, and to the Linnæan class and order *Decandria Monogynia*.

**Botanical Characters.—A small, trailing shrub; Leaves, obovate, entire, evergreen; Flowers, rose-coloured, in terminal racemes; Berry, globose, scarlet, 4-5 seeded.**

Physical Properties.—The dried leaves are dark-green, shining, convex above, concave and reticulated on the under surface; they have a very astringent, somewhat bitter taste; and emit a faint odour in the process of pulverization.

Chemical Properties.—They contain 36·4 per cent of tannin, with some gallic acid, resin, extractive, salts, &c. They yield their astringency to water, and to alcohol.

*Adulterations.*—The leaves of the red whortle-berry *(Vaccinium Vitis-idæa,)* and of the common box *(Buxus semper-virens,)* are often either mixed with, or substituted for uva-ursi; the former are readily distinguished by their under surface being dotted, not reticulate; and the latter, by their want of astringency.

Therapeutical Effects.—The employment of uva-ursi as an astringent is now altogether restricted to chronic diseases of the urino-genital apparatus, attended with mucous discharge; as in the advanced stages of catarrh of the bladder, in gleet, leucorrhœa, &c. To produce any beneficial effects its use must be persevered in for a considerable time. I have found it act very beneficially, combined with dried carbonate of soda and Dover's powder, in Bright's disease of the kidney, where there is excessive secretion of urine.

Dose and Mode of Administration.—In powder, gr. xx. to 3j.—*Extractum Uvæ ursi*, L. (Uva-ursi, bruised, ℔iiss.; boiling distilled water, cong. ij.; macerate for 24 hours; then boil down to a gallon, and strain the liquor while yet hot; lastly evaporate to a proper consistence). Dose, gr. v. to gr. xv. two or three times a day.—*Decoctum Uræ ursi*, L.

(Uva-ursi, bruised, ℥i.; distilled water, Oiss.; boil down to Oj. and strain). Dose, f℥i. to f℥iij.

INCOMPATIBLES.—All substances incompatible with tannin.

### ZINCI ACETAS. *Acetate of Zinc.*

PREPARATION.—Acetate of zinc may be readily prepared by dissolving the oxide, or carbonate of the metal in dilute acetic acid, filtering and evaporating, so as to obtain crystals.

PHYSICAL PROPERTIES.—This salt occurs in small white, rhomboidal plates, with a pearly lustre; inodorous; having a bitter, styptic taste.

CHEMICAL PROPERTIES.—It is composed of 1 eq. of oxide of zinc, 1 of acetic acid, and 3 of water, (Zn O, ($C^4H^3O^3$) + 3 HO). Exposed to the air it effloresces slowly. It is very soluble in water and in alcohol.

THERAPEUTICAL EFFECTS.—Dissolved in spirit or in water, this salt is used as a topical astringent in ophthalmia, and in chronic mucous discharges. As soon as the inflammatory symptoms have subsided, it forms an excellent injection in gonorrhœa. It has been but little employed internally, but may be used in the same cases as the sulphate.

DOSE AND MODE OF ADMINISTRATION.—Internally, gr. j. to gr. iij. made into pill with conserve of roses, or dissolved in some aqueous vehicle. For a lotion or injection, gr. ij. to gr. x. may be dissolved in f℥i. of distilled water.—*Tinctura acetatis zinci*, D. (Sulphate of zinc; and acetate of potash, of each, 1 part; rub together and add 16 parts of rectified spirit; macerate for a week, frequently agitating, and filter through paper). One drachm contains a quantity of the salt, nearly equal to four grains of the crystallized acetate; largely diluted with water it forms an excellent cooling, astringent lotion.

INCOMPATIBLES.—The stronger acids; the alkalies and their carbonates; and lime water.

ZINCI CARBONAS IMPURUM, D. CALAMINA, L. E. *Impure carbonate of zinc; Calamine.* This is one of the most common ores of zinc; previous to its being used for medical purposes, it is directed by the colleges to be burned with a red heat, and reduced to fine powder in the same manner as prepared chalk. It then constitutes prepared calamine, *Zinci carbonas impurum præparatum*, D. *Calamina præparata*, L. E. It is commonly met with in the form of a heavy flesh-coloured powder; when pure, almost entirely soluble in sulphuric acid; it is generally a very impure oxide of zinc, most if not all of the carbonic acid having been driven off by the roasting. What is sold in the shops for calamine, very frequently does not contain a particle of zinc, being sulphate of baryta coloured with Armenian bole. Calamine is used in powder, or in the form of ointment as a mild desiccative and astringent for the treatment of intertrigo, excoriations, and superficial ulcerations. The following is the only officinal preparation:—*Unguentum Calaminæ*, D. E.

*Ceratum Calaminæ*, L. ("Ointment of yellow wax, ℔v.; prepared impure carbonate of zinc, dried, ℔j.; rub the carbonate of zinc until it is completely powdered; then add it to the ointment, and mix;" D.—"Calamine; wax, of each, ℔ss.; olive oil, f℥xvj.; mix the oil with the melted wax; then remove them from the fire, and when first they begin to thicken, add the calamine and stir constantly, till they cool," L.—"Calamine prepared in the same way as prepared chalk, 1 part; simple cerate, 5 parts; mix them well together," E.). This preparation under the name of *Turner's cerate*, is in very general use, as a dessicative and healing ointment.

### Zinci oxydum, D. L. E. *Oxide of Zinc; Flowers of Zinc.*

Preparation.—*Dub.*—"Zinc, in small fragments, any quantity; throw it at separate intervals into a crucible, sufficiently deep, heated to whiteness, the mouth being inclined somewhat towards the mouth of the furnace; after the injection of each piece of zinc, invert another crucible over it lightly, so as not to exclude the air; preserve for use the light and very white sublimed powder." *Lond.*—"Sulphate of zinc, ℔j.; sesquicarbonate of ammonia, ℥viss.; distilled water, cong. iij.; dissolve the sulphate of zinc, and sesquicarbonate of ammonia, separately, in Oxij. of the distilled water, and strain; then mix. Wash what is precipitated frequently with water; and lastly, burn it for 2 hours in a strong fire." *Edin.*—"Sulphate of zinc, ℥xij.; carbonate of ammonia, ℥vj.; dissolve each in Oij. of water; mix the solutions; collect the precipitate on a cloth; wash it thoroughly; squeeze and dry it; expose it for 2 hours to a red heat."

Physical Properties.—A yellowish-white, earthy powder; inodorous and tasteless.

Chemical Properties.—It is composed of 1 eq. of zinc, and 1 of oxygen, (Zn O). When heated it becomes yellow, but regains its whiteness as it cools; at a white heat it is volatilized. Oxide of zinc is insoluble in water, but most acids dissolve it readily; from its solution in any of the acids, it is precipitated by ammonia as a white gelatinous hydrate, which is redissolved by an excess of the alkali.

*Adulterations.*—As met with in the shops, this preparation generally contains carbonate or sulphate of zinc, sometimes also lime and iron. The tests of the Edinburgh Pharmacopœia will detect these impurities:—White; tasteless; entirely soluble in dilute nitric acid; this solution is not affected by nitrate of baryta, but gives with ammonia, a white precipitate entirely soluble in an excess of the test.

Therapeutical Effects.—As an astringent, oxide of zinc is only employed externally in the form of powder or ointment, to slight excoriations, chapped nipples, intertrigo, superficial ulcerations, and in ophthalmia tarsi.

Dose and Mode of Administration.—*Unguentum (oxydi, D.) zinci*, D. L. E. (Oxide of zinc, ℥ij. (℥i., L. E.); ointment of white wax, ℔i. (prepared lard, ℥vj., L. simple liniment, ℥vj., E.); "melt the ointment, and mix in the oxide in very fine powder," D.—"mix well," L. E.).

### Zinci sulphas, D. L. E. *Sulphate of Zinc; White Vitriol.*

Preparation.—*Dub.*—"Zinc, in small fragments, 30 parts; sulphuric acid, 20 parts; water, 120 parts; pour the acid previously diluted with the water gradually on the zinc in a glass vessel; when the effervescence has ceased, digest the mixture for some time, then evaporate the filtered liquor, and after the requisite evaporation, set aside that crystals may form." *Lond.*—"Zinc, in small pieces, ℥v.; dilute sulphuric acid, Oij.; pour gradually the acid upon the pieces of zinc; and when the effervescence has ceased, strain; then boil down until a pellicle begins to form. Lastly, set aside that crystals may be formed." *Edin.*—"It may be prepared either by dissolving fragments of zinc in diluted sulphuric acid, till a neutral liquid be obtained, filtering the solution, and concentrating sufficiently for it to crystallize on cooling—or by repeatedly dissolving and crystallizing the impure sulphate of zinc of commerce, until the product when dissolved in water does not yield a black precipitate with tincture of galls."

Physical Properties.—This salt is met with in the shops, in small fragments of transparent colourless crystals, the primary form of which is the right rhombic prism; they are inodorous; but have a styptic, metallic taste.

Chemical Properties.—It is composed of 1 eq. of oxide of zinc, 1 of sulphuric acid, and 7 of water, ($ZnO, SO^3 + 7\,HO$). It effloresces in dry warm air; heated it melts in its water of crystallization, which if the temperature be increased is all driven off, and at an intense heat it is decomposed, the acid being expelled, and the oxide of zinc left. Sulphate of zinc is soluble in $2\frac{1}{2}$ parts of temperate water, and in less than its own weight of boiling water; it is also soluble in alcohol.

*Adulterations.*—The only impurity of any importance met with in this salt is oxide of iron; it may be readily detected by adding ammonia to a solution of the sulphate, when a white precipitate will be produced soluble in an excess of the alkali; but if any iron be present, it will not be completely redissolved.

Therapeutical Effects.—In large doses, unless discharged by vomiting, sulphate of zinc is an irritant poison. In small doses it acts as an astringent, and is beneficially employed as such, in chronic diarrhœa and dysentery, in excessive secretion from the bronchial tubes unaccompanied with inflammation, in fluor albus, and in gleet. As a topical remedy, it is very much employed in solution—as a collyrium in chronic ophthalmia, as a lotion in old ulcers attended with profuse discharge, and as an injection in the advanced stages of gonorrhœa, in gleet and in leucorrhœa.

Dose and Mode of Administration.—Gr. j. to gr. v. made into pill with conserve of roses, or with some astringent extract. For external use, gr. j. to 3ss. according to circumstances, may be dissolved in f℥i. of water.

Incompatibles.—Alkalies, and their carbonates; lime water; acetate of lead; nitrate of silver; astringent vegetable infusions or decoctions; and milk.

In poisoning with this salt, warm demulcent drinks, as infusion of linseed, decoction of barley, &c., should be administered to promote its evacuation by vomiting. Should inflammatory symptoms occur subsequently, they are to be combated by the usual antiphlogistic remedies.

# CHAPTER V.

## CATHARTICS.

(Purgatives—Evacuants.)

Cathartics may be defined, medicines which quicken or increase alvine evacuations. Cathartics vary much in the manner in which they produce their effects. Some act merely by exciting the muscular fibres of the intestines to increased peristaltic motion, and thus cause their contents to be more quickly and more completely evacuated. Some stimulate the mucous follicles and exhalents, so that a larger quantity of fluids than usual is excreted from the inner coat of the intestines, and thus the fecal evacuations are rendered more liquid and more copious. In many, both these properties are united; and some extend their stimulus to the neighbouring viscera also, and hence produce an increased discharge of the supplementary intestinal secretions, as the bile and pancreatic juice. Cathartics also differ as to the part of the intestinal canal on which they act; the effects of some being confined to the small, of others to the large intestines; while many of them appear to stimulate the entire tube. They differ, moreover, as to the degree in which they produce their effects, and hence have been generally divided into three classes:—*Laxatives*, which operate so mildly as merely to produce the evacuation of the intestinal contents without causing increased secretion or stimulating any of the neighbouring viscera:—*Purgatives* properly so called, which, besides remarkably increasing the peristaltic action of the intestines, occasion increased excretion of the fluids from the exhalent vessels, and from the neighbouring viscera, and also extend their stimulant effects to the system in general:—And *Drastic* or *hydragogue* cathartics, which operate in the same manner as purgatives but with much greater energy, and which if given in an overdose, produce inflammation of the intestines, characterised by constant vomiting and purging, and intense pain. Although for the sake of simplicity in our classification we have arranged the remedies belonging to those three divisions under the one head *Cathartics;* in prescribing them, due attention must be paid to the distinctions in their mode of operation, so as to fulfil the indications for which they may be administered. These distinctions will be more conveniently considered, when treating of the therapeutical effects of the individual remedies of this class.

ALOË, L. ALOË SOCOTRINA, D. E. *Aloes; Socotrine aloes; From (Inspissated juice of the leaves of,* L.*) Aloë spicata,* D. L.;—*of an undetermined species of Aloë,* E.

ALOË HEPATICA, D. ALOË BARBADENSIS, E. ALOË INDICA, E. *Hepatic aloes; Barbadoes aloes; Indian aloes.—From Aloë vulgaris,* D. *Extract or inspissated juice, of one or more undetermined species of Aloë,* E. The Edinburgh College correctly states, that aloes is obtained from various species of the genus Aloë; they are inhabitants of the East and West Indies, Socotora, Barbary, and the Cape of Good Hope; and belong to the Natural family *Liliaceæ,* and to the Linnæan class and order *Hexandria Monogynia.*

BOTANICAL CHARACTERS.—The species of the genus Aloë from which the drug is obtained, are generally characterized by having woody stems, with large, fleshy, amplexicaul, leaves, glaucous, flat above and convex below, having marginal spines or serratures; Flowers, numerous, in spikes or racemes, tubular, coloured; stamens exserted.

PREPARATION.—It is obtained by cutting the leaves transversely near their base, and evaporating the juice, which flows spontaneously from them, either in the sun or with the aid of heat; sometimes the flow of juice from the leaves is aided by plunging them in hot water; and sometimes by pressure, when an inferior sort of aloes is obtained; a still worse description is procured by evaporating a decoction of the leaves.

PHYSICAL PROPERTIES.—Obtained in these different ways, and from various parts of the world, aloes differs much in its physical properties, consequently several varieties of the drug are met with in commerce. In addition to the three kinds admitted by the Edinburgh College, we shall describe a fourth, *Cape aloes.*—1. Socotrine aloes *(Aloë Socotrina,)* is named from its being prepared in the island of Socotora, whence it is imported into England either by way of Smyrna or Bombay; it is in masses of a golden-brown colour, having a smooth, glassy fracture, and a translucent garnet-red hue at the edges; the odour is fragrant and aromatic, much heightened by being breathed on, and the taste is bitter; it yields a powder of a beautiful golden-yellow colour which is almost entirely soluble in proof spirit. The following are the characters assigned to Socotrine aloes by the Edinburgh Pharmacopœia; "In thin pieces translucent and garnet-red, almost entirely soluble in spirit of the strength of sherry. Very rare." Socotrine aloes is most probably procured from the *Aloë Socotrina,* it is imported in skins or in chests.—2. East Indian aloes *(Aloë Indica,* E.*),* is usually confounded, at least in Ireland, with the foregoing variety. It occurs in large opaque masses, of a dark liver-brown colour, with a dull, waxy, fracture; the odour is similar to, but weaker than that of socotrine aloes, and the taste equally bitter; it yields a dull reddish-yellow powder, a great part of which is insoluble in proof spirit. It is brought to England in skins and chests from Bombay, but it is stated to be originally obtained from the coasts of the Red Sea. It is probably derived from a species of aloë if not identical with, nearly allied to, the *Aloë Socotrina.*—3. Barbadoes aloes *(Aloë Barbadensis,* E. *Aloë hepatica* D.*),* is a product of Barbadoes, Jamaica, and other West India islands, whence it is imported in gourd-

shells, occasionally in boxes. It is of a dark liver-brown, sometimes almost black colour; the fracture is dull and opaque, the odour strong and disagreeable, resembling that of the human axilla, and the taste very bitter. It is reduced to powder with difficulty, the powder being of a dull dark-yellow colour. This variety is obtained from the *Aloë vulgaris,* and probably from some allied species.—4. Cape aloes *(Aloë Capensis,)* is imported in skins and in chests from the Cape of Good Hope, and is very common in English commerce although not introduced into any of the Pharmacopœias. It is of a glossy resinous appearance, a dark brown colour, with a greenish-yellow shade especially when in small fragments, a strong disagreeable odour much increased by breathing on it, and an acrid bitter taste; it is very brittle, and readily reduced to powder, which is of a shining, greenish-yellow colour. It is procured from the Aloë spicata and several other allied species.

Chemical Properties.—The most important constituent of aloes, is a bitter extractive matter *(Aloësin,* Pfaff, *Aloïne,* Mesmer,) amounting in the finer sorts to nearly 80, in the inferior to about 50 per cent; it is probably the active principle of the drug. The finer sorts of aloes contain also resin and a peculiar acid *(Aloëtic acid,* Pereira); in addition to these substances, the inferior sorts contain some vegetable albumen. Aloes is almost completely soluble in boiling water, but as the water cools a dark brown substance insoluble in cold water is deposited; it is very sparingly soluble in rectified spirit, but dissolves almost entirely in proof spirit, and still more readily in weaker spirit; heated, it fuses imperfectly, and if the heat be continued is converted into a resinous-looking, very friable mass.

*Adulterations.*—The only adulteration of aloes is, the mixing the inferior sorts with, or substituting them for, the finer kinds; of this we can judge by the physical characters, particularly the odour when breathed on, or by the solubility in weak spirit.

Therapeutical Effects.—In moderate doses, from three to ten grains, aloes acts as a stimulating cathartic, influencing especially the large intestines, on which it operates rather by exciting their peristaltic action, than producing increased secretion from their mucous membrane. It produces its effects more slowly than most other medicines of this class, from ten to eighteen hours usually elapsing before it operates. The specific action of aloes on the large intestines contraindicates its employment in hemorrhoidal affections, in irritation or inflammation of the pelvic viscera, the prostrate gland or the urethra, in pregnancy or during the menstrual discharge. From its mode of operation it is also evidently not adapted for cases in which we wish to produce increased secretion from the intestinal canal, or where a speedy operation is required. The employment of aloes as a purgative, is nevertheless, very general, and perhaps there are few vegetable cathartics more extensively used. In torpor of the intestines, especially when accompanied with deficient secretion of bile, it is the most useful of this class of remedies; indeed it appears to be the best substitute for that secretion, and is therefore exhibited with the most beneficial results in jaundice when unaccompanied with hepatic inflammation, mechanical

obstruction of the ducts, &c. In habitual costiveness so common in females, aloes is also administered with much benefit, due attention being paid to the circumstances which contraindicate its employment. Christison states, that the cathartic property of aloes is much increased by its combination with sulphate of iron, and that its irritating action on the rectum is counteracted by combining it with extract of hyoscyamus.

Dose and Mode of Administration.—*Aloë socotrina*, D. L. E. *Aloë indica*, E. gr. iij. to gr. xv.—*Aloë hepatica*, D. *Aloë barbadensis*, E. gr. ij. to gr. v. It is best administered in the form of pill, made with honey, mucilage, &c.—*Extractum Aloës hepaticæ*, D. *Extractum Aloës purificatum*, L. ("Prepared as the simpler extracts," D.—"Aloes, powdered, ℥xv.; boiling water, cong. j.; macerate for three days with a gentle heat; strain, allow the feces to subside; pour off the clear liquor, and evaporate to a proper consistence;" L.). Dose, gr. v. to gr. xv.; this is a useless preparation when we can obtain good aloes.—*Pulvis Aloës cum Canella*, D. (Hepatic aloes, ℔j.; canella alba, ʒiij.; rub together to powder, and mix); *Hiera Picra;* formerly much used as an emmenagogue, but little employed now; Dose, gr. vi. to gr. xvi̯ij.—*Pulvis Aloës compositus*, D. L. (Hepatic (Socotrine, L.) aloes, ʒiss.; guaiacum resin, ʒi.; aromatic powder (compound cinnamon powder, L.), ʒss.; rub the aloes and guaiacum separately to powder, and mix in the aromatic (cinnamon, L.) powder). A stimulating cathartic not much used. Dose gr. x. to ℈i.—*Pilulæ Aloës*, E. (Socotrine aloes, and Castile soap, of each, equal parts; conserve of red roses, q. s.; beat into a proper pill mass. This pill may also be correctly made with the finer qualities of East Indian aloes, as the Socotrine variety is very scarce; and many prefer, not without reason, the stronger Barbadoes aloes.) Dose. gr. x. to ʒss.—*Pilulæ Aloës compositæ*, D. L. (Hepatic (Socotrine, L.) aloes, (powdered, L.), ʒi.; extract of gentian, ʒss.; oil of caraway, min. xl.; simple syrup, a sufficiency, mix). An excellent habitual purgative. Dose, gr. v. to gr. xv.—*Pilulæ Aloës cum Myrrhâ*, D. L. E. (Hepatic (Socotrine, L. Socotrine or East India, E.) aloes, (powdered, L.), ℥ij. (4 parts, E.); saffron, ℥j. (1 part, E.); myrrh, ℥i. (2 parts, E.); syrup (conserve of red roses, E.), q. s.; beat to a proper mass). *Rufus' Pills.* An excellent stimulating cathartic and emmenagogue. Dose, gr. x. to gr. xx.—*Pilulæ Aloës et Assafœtidæ*, E. (Socotrine or East Indian aloes; assafœtida; and Castile soap, equal parts; conserve of red roses, q. s.; beat to a proper mass). Cathartic and antispasmodic. Dose, gr. x. to gr. xv.—*Pilulæ Aloës et Ferri*, E. (Sulphate of iron, 3 parts; barbadoes aloes, 2 parts; aromatic powder, 6 parts; conserve of red roses, 8 parts; pulverise the aloes and sulphate of iron separately, and beat into a proper mass, which is to be divided into five grain pills). Tonic and cathartic, well adapted for chlorosis. Dose, one to three daily.—*Pilulæ ante cibum*, P. (Aloes, 6 parts; extract of cinchona, 3 parts; canella, 1 part; syrup of wormwood, q. s.; divide into four grain pills). One or two before dinner.—*Decoctum Aloës compositum*, D. L. *Decoctum Aloës*, E. (Extract of liquorice, ʒss. (℥vij., L.); carbonate of potash, ℈ij. (℥i., L.); hepatic (socotrine, L. or hepatic, E.) aloes, bruised (powdered, L.); myrrh, bruised (powdered, L.); and

saffron, of each, ʒi. (ʒiss. L.); water, *by measure* ℔j. (Oiss. L.); boil together down to fʒxij. (Oi., L.), strain and add of the compound tincture of cardamoms, fʒiv. (fʒviij., L.). A mild cathartic with tonic properties; Acids, acidulous and most metallic salts are incompatible in prescription with it. Dose, fʒss. to fʒij.—*Vinum Aloës*, D. L. (Socotrine aloes, rubbed to powder, ʒiv. (ʒij., L.); canella bark, powdered, ʒj. (ʒiv., L.); sherry wine, *by measure* ℔iij. (Oij. L.); (proof spirit, *by measure* ℔j. D.); macerate for 14 days with frequent agitation and strain).—E. (Socotrine or East Indian aloes, ʒiss.; cardamom seeds, ground; and ginger, in coarse powder, of each, ʒiss.; sherry, Oij.; digest for seven days, and strain through linen or calico). A warm purgative. Dose, fʒss. to fʒij.—*Tinctura Aloës*, D. L. E. (Socotrine (or East Indian, E.) aloes, powdered, ʒss. (ʒi., L. E.); extract of liquorice, (dissolved in ʒviij. of boiling water, D.), ʒiss. (ʒiij., L. E.); proof (rectified, L. E.) spirit, *by measure* ʒviij. (Oss., L. fʒxij., E.); (water Oiss., L. fʒxxviij., E.); digest for seven (fourteen, L.) days and filter). Cathartic and tonic. Dose, min. xxx. to fʒss.—*Tinctura Aloës composita*, D. L. *Tinctura Aloës et Myrrhæ* E. (Socotrine (or East Indian, E.) aloes, powdered, ʒiij. (ʒiv., L. E.); tincture of myrrh, *by measure* ℔ij. (Oij.; and saffron, ʒij., L. E.); macerate for fourteen (seven, E.) days and filter). Stomachic and cathartic. Dose, fʒss. to fʒij.—*Enema Aloës*, L. (Aloes, ϑij.; carbonate of potash, gr. xv.; decoction of barley, Oss.; mix and rub them together). A useful stimulating cathartic in the constipation of amenorrhœa; also employed for dislodging ascarides from the rectum.

Calomelas, E. Calomelas sublimatum, D. Hydrargyri chloridum, L. *Calomel; Sublimed Calomel; Chloride of Mercury. (Subchloride of Mercury*, Graham).

Calomelas præcipitatum, D. *Calomel, by precipitation.*

Preparation.—Calomelas sublimatum, D. "Persulphate of mercury, 25 parts; purified mercury, 17 parts; muriate of soda, dried, 10 parts; triturate together in an earthen-ware mortar, the persulphate and the purified mercury, till the metallic globules shall have completely disappeared, then add the dried muriate of soda; mix well, and in a suitable vessel, with a gradually increased heat, sublime into a receiver; reduce the sublimed mass to powder, and wash it with water, as long as the decanted liquor precipitates with solution of caustic potash; finally dry the sublimed calomel."—Hydrargyri chloridum, L. Mercury, ℔iv.; sulphuric acid, ℔iij.; chloride of sodium, ℔iss.; distilled water, a sufficiency. Boil ℔ij. of the mercury with the sulphuric acid in a proper vessel, until a bipersulphate of mercury remains dry; rub this when it is cold with ℔ij. of mercury in an earthen mortar, that they may be perfectly mixed. Afterwards add the chloride of sodium, and rub them together until globules are no longer visible; then sublime. Rub the sublimate to very fine powder, and wash it carefully with boiling distilled water, and dry it."—Calomelas, E. "Mercury, ʒviij.; sulphuric acid, fʒij. fʒiij.; nitric acid, fʒss.; muriate of soda, ʒiij.; mix the acids, add to them ʒiv. of the mercury, and dissolve it with the aid of a moderate heat; raise the heat so as to obtain a dry salt. Triturate this with the muriate of soda and the rest of the mercury, till the globules entirely disappear; heat the mixture by means of a sand-bath in a proper subliming apparatus. Reduce the sublimate to fine powder; wash the

powder with boiling distilled water until the water ceases to precipitate with solution of hydriodate of potash; and then dry it."—CALOMELAS PRÆCIPITATUM, D. "Purified mercury, 17 parts; diluted nitric acid, 15 parts; pour the acid upon the mercury, put into a glass vessel, and as soon as the mixture ceases to effervesce, digest with a medium heat for 6 hours, frequently agitating; then increase the heat that the liquor may boil for a short time, pour off from the residual mercury, and mix the liquid immediately with a solution of 7 parts of muriate of soda in 400 parts of boiling water; wash the precipitated powder with warm distilled water, as long as the poured of liquor is affected by solution of caustic potash; finally dry the powder."

PHYSICAL PROPERTIES.—Calomel as obtained by sublimation, is sometimes in the form of a semitransparent, white, crystalline cake, the crystals being four-sided prisms; as usually met with, however, it is a heavy, snow-white, soft powder, inodorous and tasteless. Its sp. gr. is 6·5 (Graham).

CHEMICAL PROPERTIES.—Calomel is a subchloride of mercury, being composed of 1 eq. of chlorine, and 2 of mercury ($Hg^2$ Cl.). It is completely insoluble in cold or boiling distilled water, in alcohol, or in ether. It acquires a yellow tinge by exposure to the air, or by rubbing; exposed to heat it becomes yellow, and volatilizes at a heat below redness, if under pressure it fuses; with lime water it gives a blackish precipitate, *sub-oxide* of mercury.

*Adulterations.*—Calomel sometimes contains corrosive sublimate, which may be detected by agitating with sulphuric ether, pouring off the clear liquid and evaporating, if any sublimate be present a crystalline powder is left which becomes yellow with solution of caustic potash; this adulteration I have repeatedly detected in calomel, my attention having been always first directed to it, by the irritation which it produced when administered to patients; one patient to whom calomel thus adulterated was given in the form of powder, complained of a burning sensation in the back of the mouth and pharynx. The presence of any fixed white powder may be detected by applying a sufficient heat to sublime the calomel.

THERAPEUTICAL EFFECTS.—Calomel is seldom employed alone as a cathartic, but combined with other remedies of this class it is very frequently used, chiefly in consequence of its action on the secreting organs, stimulating the liver and intestinal glands to increased action. It is therefore peculiarly adapted for all diseases, attended with functional derangement of the hepatic system; as well as for those cases in which there is determination of blood to the vessels of the brain, as in some forms of chronic head-ache, in threatened apoplexy, and paralysis, &c. It is also used with much benefit as a purgative in the early stages of inflammatory disease and of fevers, more especially in the fevers of warm climates, in which it is generally given in very large doses, from 15 to 30 grains, its cathartic action not being increased in proportion to the dose. Calomel is well suited as a cathartic for children, being tasteless, and in general producing copious alvine evacuations without pain; here also its combination with other purgatives, as jalap or scammony, will be attended with benefit. In verminous diseases it is the best purgative that can be employed, as it not only dislodges the worms from the intestines, but also acts as a poison to them. (See *Special Stimulants.)*

Dose and Mode of Administration.—In powder or pill, from gr. ij. to gr. vj.—*Pilulæ catharticæ compositæ*, U. S. (Calomel ʒiij., compound extract of colocynth, in powder, ʒss., extract of jalap, in powder, ʒiij., gamboge, in powder, gr. xl.; form them into a mass with water and divide into 180 pills). An excellent purgative combining efficiency of action and comparative mildness with smallness of bulk. Each pill contains one grain of calomel; Dose one or two pills.—*Pilulæ purgantes cum mercurio*, Den. (Calomel, four parts; extract of rhubarb, eight parts; resin of jalap, one part; oil of orange peel, q. s.; mix). Dose, gr. ij. to gr. viij.

Incompatibles.—The alkalies, and their carbonates; chloride of sodium; lime water; nitric and muriatic acids; iodide of potassium; sulphuretted hydrogen, and its combinations; soaps, &c.

Cambogia, (Siamensis,) E. Cambogia, L. Gambogia, D. *Siam gamboge; Gamboge. Gum resin of Stalagmitis Cambogia*, D.—*Stalagmitis Cambogioides*, L.—*From an unascertained plant inhabiting Siam, probably a species of Hebradendron*, E.

Cambogia, (Zeylanica), E. *Ceylon gamboge; Gummy-resinous exudation of Hebradendron gambogioides.* The plant which yields commercial or Siam gamboge is not yet ascertained; it is conjectured by the Edinburgh College, to be a species of Hebradendron nearly allied to the Hebradendron gambogioides, from which plant Ceylon gamboge is procured; but more recent investigations tend to prove that it is the produce of the Garcinia cochinchinensis. It belongs to the Natural family *Guttiferæ* (*Clusiaceæ*, Lindley), and to the Linnæan class and order *Monœcia Monadelphia.*

Botanical Characters.—A handsome tree of moderate size, with opposite, stalked, leaves; unisexual flowers, sessile and axillary; and a pleasant, saccharine fruit, about the size of a cherry, four celled, each cell one seeded.

Preparation.—In Ceylon, gamboge is procured by making incisions into the bark of the tree or removing a piece of it, whence, a viscid, bright-yellow juice exudes, which when dried by exposure to the sun in shallow bowls, concretes into a hardened mass. In Siam it is said to be obtained by breaking across the young branches and leaves, and collecting the juice that drops from them; be this as it may, the finer qualities are allowed to dry in the hollow stems of the bamboo-cane, or probably the juice is collected in them; and of late it has been more than once imported in the reeds.

Physical Properties.—Commercial or Siam gamboge is generally met with in two forms; that of cylinders, sometimes hollow, more frequently solid—*Pipe Gamboge;* and in irregular shaped masses—*Cake or Lump Gamboge,* Pipe gamboge is of a rich, reddish-yellow colour, generally greenish and dusty externally; inodorous, tasteless at first, but soon causing a sense of acridity in the throat; brittle, with a smooth, glistening, conchoidal fracture. Lump gamboge is of a duller colour, its fracture is splintery with scarcely any lustre, and it contains small fragments of wood, and many air-vesicles. *Ceylon Gamboge,* (for a specimen of which I am indebted to my friend, Professor Christison),

is not an article of English commerce; it is a coarse looking substance with numerous air-vesicles, of a dull reddish-yellow colour with many dark-brown spots.

Chemical Properties.—Gamboge is composed of resin *(Gambogic acid)*, soluble gum, and a trace of woody fibre; the proportion of the resin, which is the active principle, varies, according to several of Christison's analyses, from 68 to 75 per cent. Gamboge although not soluble in water, forms a perfect emulsion with it; it is almost entirely soluble in rectified spirit, and sulphuric ether completely dissolves out the resin, leaving the gum.

*Adulterations.*—The inferior varieties of gamboge are adulterated with some amylaceous matter, they also generally contain lignin; the former is detected by a cooled decoction becoming greenish on the addition of tincture of iodine, and the presence of the latter may be known by the fracture not being smooth and conchoidal.

Therapeutical Effects.—Gamboge is a drastic cathartic, producing even in small doses frequent and copious watery evacuations, accompanied with much irritation of the stomach and bowels; in somewhat larger doses it occasions vomiting and even sometimes inflammation of the intestinal canal, followed by death; a single drachm has proved a fatal dose in more than one instance, the post-mortem appearances being ulceration and mortification of the intestines. In consequence of the distress caused even by medicinal doses of gamboge, it is seldom employed alone as a purgative, but is frequently added to other remedies of this class, either to augment their power, or to produce increased secretion from the alimentary canal. It is chiefly used as a cathartic in dropsical affections, for which it is well adapted as it both causes a large discharge of serum from the intestines, and stimulates the kidneys to increased action. The combination of gamboge with an alkali, as with carbonate of potash, acts as a diuretic of much power, and such a preparation under the name of *tincture of gamboge* is highly praised by many continental authors. The resin of gamboge in somewhat smaller doses acts precisely similar to the drug itself.

Dose and Mode of Administration.—In powder, pill, or emulsion, gr. ij. to gr. v. which may be repeated every five or six hours until it operates; it should be always finely powdered and combined with some comparatively inert substance, as sugar, sulphate of potash, or cream of tartar.—*Pilulæ Cambogiæ compositæ*, D. L. (Gamboge, powdered, ℥i.; aloes (hepatic, D.), ℥iss.; ginger, powdered, ℥ss.; soap, ℥ij.; mix the powders together, add the soap, and (with the aid of treacle, D.), beat them into a mass). A useful cathartic combination, operating effectually in doses of from gr. x. to gr. xx.—*Pilulæ Cambogiæ*, E. (Gamboge; East Indian or Barbadoes aloes; and aromatic powder, of each, one part; Castile soap, two parts; pulverize the aloes and gamboge separately, mix all the powders, add the soap, and with the aid of syrup beat into a proper pill mass); Properties and dose same as last.—*Tinctura Gambogiæ*, Voigtel. (Gamboge, powdered, ℥ss.; carbonate of potash, ℥i.; brandy, f℥xij.; mix the powders intimately, add the spirit and digest for four days with a gentle heat). An excellent diuretic. Dose, f℥ss. to f℥i.

In cases of poisoning with gamboge, emollient and demulcent drinks

should be given, and similar enemata administered; to be followed by small but repeated doses of opium, blood-letting, and the warm bath.

Cassiæ pulpa, E. Cassia, L. Cassia fistula, pulpa leguminis, D.—*Cassia pulp. Pulp of the pods of Cassia fistula.* This tree originally a native of Africa, is now generally diffused over the East and West Indies; it belongs to the Natural family *Leguminosæ (Fabaceæ,* Lindley), and to the Linnæan class and order *Decandria Monogynia.*

Botanical Characters.—A handsome tree, about thirty feet in height; with alternate, pinnate, leaves; bright-yellow papilionaceous flowers in racemes; and cylindrical legumes or pods, about one or two feet long, of a blackish-brown colour.

Preparation.—The pulp of the pods is the part employed in medicine. It is usually prepared by pouring boiling water on the bruised pods, so as to wash out the pulp, pressing through a sieve, and evaporating the solution thus obtained to the consistence of a thick extract.

Properties.—Cassia pulp is of a reddish-black colour, and has a sweetish mucilaginous taste, but no odour. It consists of sugar, gum, mucilaginous extractive and colouring matter; no principle possessing purgative properties has been as yet discovered in it. It is almost entirely soluble in both alcohol and water.

*Adulterations.*—The pulp is not liable to adulteration; those pods only should be chosen, which are heavy, and in which the seeds do not rattle.

Therapeutical Effects.—Cassia pulp is a mild laxative, at present but seldom employed; it is only adapted for febrile or inflammatory affections occurring in persons of delicate habit or in children. Combined with manna, its cathartic properties are said to be much increased.

Dose and Mode of Administration.—Of the pulp, ʒss. to ʒiij.—*Electuarium Cassiæ,* D. *Confectio Cassiæ,* L. (Cassia pulp, (recently expressed, D.), ℔ss.; manna, ʒij.; tamarind pulp, ʒi.; syrup of orange (of roses, L.), ℔ss.; bruise the manna and dissolve it (with a gentle heat, D.), in the syrup, then add the pulps and evaporate (slowly D.), to a proper consistence). Dose, ʒij. to ʒi.

Colchici cormus et semina, E. L. Colchicum autumnale, bulbus et semina, D.—*The cormus (bulb,* D.*) and seeds of Colchicum autumnale. Meadow-saffron.* A common indigenous plant belonging to the Natural family *Melanthaceæ,* and to the Linnæan class and order *Hexandria Trigynia.*

Botanical Characters.—Cormus (improperly called bulb), fleshy, covered with a loose, brown, membrane; giving origin in the middle of summer to a young cormus, which remains attached to the parent, grows rapidly, and sends up in autumn a naked white tube or flowering stem, terminating in a pale purple, crocus-like flower; the flower soon dies; and the seed vessel which remains

under ground, springs up with the erect, broadly lanceolate leaves, in the ensuing February or March.

Preparation.—The cormus should be gathered about the end of July or beginning of August, before the flowering stem is sent up; for medical purposes, it is cut transversely into thin slices, the dry coats having been previously removed; the slices are dried in a dark place, exposed to the air, with a heat not exceeding 170°. Mr. Houlton states that the colchicum cormus, when dried entire, retains its active properties much more perfectly, and for a much longer period than if it is sliced. He also recommends it to be dried without artificial heat, which he says may be readily done by stripping off the loose dry coats, and carefully removing the young bud or bulb. The seeds are gathered when ripe.

Physical Properties.—Colchicum cormus is ovoid, about the size of a large walnut, compressed on one side, convex on the other; it may be distinguished from bulbous roots by being solid, and not composed of laminæ or scales. The dry slices are of a grayish-white colour, and firm. The seeds are small, rough, nearly round, and of a blackish-brown colour. Both seeds and cormus are odourless, but have a bitter, acrid taste. The flowers both in the fresh and dried state have been occasionally employed, but they are not so certain in their effects as either the seeds or cormus.

Chemical Properties.—The cormus consists of fatty matter, a volatile acid, a peculiar uncrystallizable alkaloid named *veratria* (which will be described under the head of General Stimulants) combined with gallic acid, starch, gum, inulin, and lignin, (Pelletier and Caventou). The composition of the seeds is probably nearly the same. The active principles are extracted by water, alcohol, vinegar, and wine.

*Adulterations.*—From having been gathered at an improper season or from careless drying or preservation, colchicum cormus is in general nearly inert. When good the dried slices are firm, and notched only on one side; and a fresh-scraped surface, moistened with vinegar, and tincture of guaiacum dropped on it, is turned blue.

Therapeutical Effects.—The most constant effect, indeed, in general, the only manifest one, of colchicum is purging; its cathartic operation being accompanied with great depression of the circulation and much debility. In large or frequently repeated doses it produces nausea, vomiting, and hypercatharsis; and in small doses it is held by many to be diuretic, but this effect is uncertain. Under its use, the quantity of uric acid in the urine is very much augmented. The principal diseases in which colchicum has been employed are gout and rheumatism; for the former of which, it has acquired the character of being a specific. Administered during a paroxysm of gout, it seldom fails to alleviate the pain and cut short the fit; but so far from preventing a return of the attack, most practitioners agree that the employment of colchicum renders the system more predisposed to the disease, indeed, frequently gives rise to irregular or atonic gout. In acute rheumatism, the employment of colchicum requires the greatest caution, and indeed is very seldom admissable; but in some of the chronic forms of the disease especially gouty rheumatism, it is often used in robust constitutions with benefit. Owing to its effect on the secretion of uric acid, it is employed with the

best possible effect in diseases of the urinary organs in which oxalate of lime is present in the urine. Colchicum has been also employed as a cathartic and diuretic in dropsy, and as an antiphlogistic in febrile and inflammatory diseases; but in the present day its use is almost entirely confined to gout and rheumatism.

Dose and Mode of Administration.—In the administration of colchicum or any of its preparations, we should always begin with small doses and increase them very gradually, as no medicine varies more in its action on different persons, and besides the pharmaceutical preparations differ much in activity. It is seldom used in the form of powder, the dose is from gr. ij. to gr. viij.; the powder of the seeds should be preferred to that of the cormus, as being more uniform.—*Acetum Colchici*, D. L. E. (Fresh colchicum cormus, sliced, ℥i.; distilled vinegar, f℥xvj.; proof spirit, f℥i.; macerate the colchicum in the vinegar for three days in a covered glass vessel; press, strain, and set aside that the dregs may subside; add the spirit to the clear liquor). This preparation is preferred by Scudamore to any other for gout, he recommends magnesia to be combined with it, to saturate the acid. It is, however, of very uncertain strength, in consequence of being frequently prepared with the dry bulb. Dose, f℥ss. to f℥ij., frequently repeated.—*Extractum Colchici (cormi)*, L. (Fresh colchicum cormus, ℔j.; bruise with a little water in a stone mortar, press out the juice and evaporate it unstrained, to a proper consistence). Dose, gr. j., every three or four hours; not much used.—*Extractum Colchici (cormi) aceticum*, L. E. (Fresh colchicum cormus, ℔j.; acetic (pyroligneous, E.) acid, f℥iij.; bruise the cormus, gradually adding the acid, express the juice, and evaporate it in a porcelain vessel not glazed with lead, (over the vapour bath, E.), to a due consistence). Dose, gr. i. to gr. iij., two or three times a day. Made into pill with an equal quantity of extract of colocynth, it forms an excellent cathartic in gouty and rheumatic affections.—*Oxymel Colchici (cormi)*, D. (Fresh colchicum bulb, cut into thin slices, ℥i.; distilled vinegar, f℥xvj.; clarified honey, *by weight* ℔ij.; macerate the colchicum with the vinegar in a glass vessel for two days, express strongly, strain, and add the honey; and boil down the mixture to the consistence of a syrup, frequently stirring with a wooden spatula). Dose, ℥i., gradually increased to ℥ij., twice a day; not much used.—*Tinctura Colchici (seminum)*, D. L. E. (Colchicum seeds, (bruised, L., ground finely in a coffee mill, E.), ℥ij. (℥v., L. E.); proof spirit, f℥xvi. (Oij., L. E.); macerate for 14 days and strain, D. L., "to be prepared like tincture of cinchona, and percolation is much more convenient and speedy than digestion," E.). Dose, f℥i. gradually increased to f℥ij., twice daily.—*Tinctura Colchici composita*, L. (Colchicum seeds, bruised, ℥v.; aromatic spirit of ammonia, Oij.; macerate for 14 days and strain). Dose, min xx. to min. xxx., three times a day; seldom used.—*Vinum Colchici*, L. E. (Colchicum cormus, dried and sliced, ℥viij.; sherry wine, Oij.; digest for 14 (7, E.) days, (express strongly the residuum, E.), and strain). It may be prepared with the seeds *(Vinum seminum Colchici)*, using the same proportion, a preferable preparation as being more uniform; Dose. f℥ss., gradually increased to f℥ij., three or four times a day.—*Succus Colchici*, is prepared by expressing the juice from fresh cormi, allowing it to stand 48 hours

to deposit the fecula, and adding to the clear liquor a fifth of rectified spirit. This is a most active preparation, and keeps well. Dose, min. v. to min. xx.

INCOMPATIBLES.—Acids; tincture of iodine; tincture of guaiacum; and all astringent vegetable infusions and decoctions.

In cases of poisoning with colchicum, emetics followed by demulcent drinks should be immediately administered; and if coma be present, brandy, ammonia, coffee and other powerful stimulants should be given. The vegetable astringents have been recommended as antidotes, tannic acid forming an insoluble precipitate with veratria.

COLOCYNTHIS, L. E. CUCUMIS COLOCYNTHIS, FRUCTUS PULPA, D. *Colocynth. Pulp (dried,* L.*) of the fruit of Cucumis colocynthis.* This plant, the bitter cucumber, is a native of several parts of Asia and Africa, and is cultivated in Greece and Spain; it belongs to the Natural family *Cucurbitaceæ*, and to the Linnæan class and order *Monœcia Syngenesia*.

BOTANICAL CHARACTERS.—A creeping, procumbent, annual; Leaves ovato-cordate; Flowers, yellow, axillary, solitary; Fruit *(pepo)*, globose, about the size of an orange, yellow when ripe, with a thin solid rind

PREPARATION.—The fruit is gathered when ripe, peeled and dried. In some countries it is dried without being peeled.

PHYSICAL PROPERTIES.—The pulp of the dried fruit, which is the officinal part, is of a pale yellowish-white colour; it is without odour, but has an intensely bitter, nauseous taste; it is light, spongy, porous, and so tough as to be with difficulty reduced to powder. The unpeeled fruit *(Mogadore Colocynth)*, is imported in small quantities into England, but is only used by druggists in show-bottles.

CHEMICAL PROPERTIES.—Colocynth pulp contains a peculiar bitter matter, which has been named *Colocynthin* and on which its purgative property is supposed to depend, resin, pectin, gummy matter, and various salts. It yields its active properties to both water and alcohol.

*Adulterations.*—Colocynth pulp is not liable to adulteration; but if it be of a greyish or brownish colour, it is of inferior quality.

THERAPEUTICAL EFFECTS.—Colocynth operates as a stimulant to the intestinal canal, its influence being specially directed to the large intestines, promoting both their secretion and exhalation, as well as increasing their vermicular motion; in large doses it is a dangerous poison, producing intestinal inflammation. In consequence of the drastic properties it possesses when administered alone, it is always combined with other cathartics in order to mitigate its action, as in the several pharmacopœial preparations, and is thus exhibited with much advantage in habitual constipation, in passive dropsies, in alvine obstruction, and as a revulsant in determination of blood to the brain. It is also said to possess diuretic properties.

DOSE AND MODE OF ADMINISTRATION.—In powder (now seldom used) gr. ij. to gr. viij. mixed with some inert powder. Powdered colocynth if sprinkled over a blistered surface acts as a cathartic as

actively as if administered by the mouth, and it may be used with advantage in this way in apoplexy and other diseases in which the patient is unable or unwilling to swallow. Its use must not, however, be pushed too far, as if it does not purge, it is apt to cause inflammation of the intestines.—*Extractum Colocynthidis (simplex,* D.), D. L. E. (Colocynth pulp, ℔j.; water, (distilled, L.), cong. j. (cong. ij. L. E.); boil, down to ℔iv. *by measure,* (for six hours gently, replacing the water occasionally, L. E.), strain while hot, and evaporate (in the vapour-bath, E.) to a proper consistence). A bad preparation as it does not keep well; but seldom used; Dose, gr. v. to ʒi.—*Extractum Colocynthidis compositum,* D. L. (Colocynth pulp, cut small, ℥vj.; hepatic aloes (purified extract of aloes, L.), ℥xij.; scammony, powdered, ℥iv.; cardamom seeds, powdered, ʒi.; (hard, D.) soap, ʒiij.; proof spirit, cong. j.; macerate the colocynth in the spirit for four days with a gentle heat; add the aloes, scammony, and soap to the (expressed, D.) and strained liquor; then evaporate to a proper consistence (for making pills, D.), the cardamom seeds being mixed in towards the end). One of the most generally employed, and safest cathartics in the whole Materia Medica, and if the various substances of which it consists be pure, equally efficacious as safe. Dose, gr. v. to gr. xv.—*Pilulæ Colocynthidis,* E. (Socotrine or Indian aloes; and scammony, of each, 8 parts; colocynth, 4 parts; sulphate of potash; and oil of cloves, of each, 1 part; rectified spirit, a sufficiency; pulverise the aloes, scammony, and sulphate together, mix the colocynth in fine powder, add the oil, and with the aid of a little spirit, beat into a proper pill mass). *Pilulæ Colocynthidis compositæ,* D. (Hepatic aloes; and scammony, of each, ʒi.; colocynth pulp, ℥ss.; Castile soap, ʒij.; sulphate of potash; and oil of cloves, of each, ʒi.; process the same as in the *Ed. Ph.,* the soap with a little treacle, being employed instead of the spirit). Both these preparations resemble in their operation the compound extract, to which I think they are to be preferred, the dose is the same.—*Pilulæ Colocynthidis et Hyoscyami,* E. (Colocynth pill mass, 2 parts; extract of hyoscyamus, 1 part; beat well together, adding a few drops of rectified spirit if necessary; and divide into five grain pills). An excellent preparation, peculiarly adapted for persons with irritable bowels. Dose 1 to 3 pills.—*Enema Colocynthidis,* L. (Compound extract of colocynth, ʒij.; soft soap, ʒi.; water, Oj.; mix and rub together). An efficient enema in obstinate constipation and colic.—*Tinctura Colocynthidis,* Pr. Pol. F. B. (Colocynth, ʒi.; star anise, ʒi.; rectified spirit, ℥xiv.; digest for three days and filter). Dose, min. x. to min. xv. in a mixture.—*Decoctum Colocynthidis,* B. (Colocynth, ʒi.; boiling water, ℥vj.; boil for ten minutes, strain, and add sulphuric ether, ʒi.; syrup of orange peel, ʒi.). Both these preparations are diuretic; Dose, f℥ss. two or three times daily.

Incompatibles.—The fixed alkalies; lime water; sulphate of iron; acetates of lead; nitrate of silver; and corrosive sublimate.

Crotonis Tiglii, oleum, D. Tiglii oleum, L. Crotonis oleum, E. *Croton oil. Expressed oil of the seeds of Croton Tiglium.* A native of the continent of India, the Molucca Islands and Ceylon; belonging

to the Natural family *Euphorbiaceæ*, and to the Linnæan class and order *Monœcia Monadelphia*.

Botanical Characters.—A moderate-sized tree, with a smooth bark; Leaves, oblongo-ovate, acuminate, with two flat round glands at the base; Flowers, white, in terminal racemes; Fruit, ovate and triangular, somewhat bigger than a hazel nut, three celled, each cell one seeded.

Physical Properties.—Croton seeds *(Grana Tiglii)* are of an irregularly-oval shape, about 6 lines long, $2\frac{1}{2}$ lines thick, and 3 lines broad; they are of a greyish-brown colour, and marked with the ramifications of the raphé; they contain internally a pale yellowish-white albumen, which envelops the embryo with its large leafy cotyledons. From the kernels, croton oil is obtained by pressure; it is thicker than castor oil, of a pale amber colour, has a feeble sickly odour, and an intensely acrid taste. The kernels yield about half their weight of oil.

Chemical Properties.—Croton oil consists of a peculiar acid named *Crotonic acid*, dissolved in a bland fixed oil; it is to the acid that the properties of the oil are due. Croton oil is insoluble in alcohol even with the aid of heat, but is very soluble in sulphuric ether, and in the fixed and volatile oils.

*Adulterations.*—Castor oil is the only substance employed to adulterate croton oil, it may be readily detected by its solubility in alcohol, the test adopted by the Edinburgh College :—"when agitated with its own volume of pure alcohol and gently heated, croton oil separates on standing, without having undergone any apparent diminution."

Therapeutical Effects.—Croton oil is an acrid cathartic, operating speedily, and producing frequent watery evacuations; it does not in general give rise to nausea or griping, and is consequently to be preferred in most cases to other cathartics of equal power. It is used chiefly in obstinate constipation, in comatose affections, and in dropsy. In the various forms of convulsive and neuralgic diseases, it is a most valuable cathartic; given in frequently repeated small doses in such affections, I have in several cases found it a complete specific. Croton oil should not be employed in extreme debility, or where there is any tendency to inflammation in the digestive organs.

Dose and Mode of Administration.—Min. j. or min. ij.—In cases where the patient is unable or unwilling to swallow, it may be dropped on the tongue, or dissolved in ether may be rubbed on the abdomen. If it can be avoided, however, it should never be administered in a fluid form, as it causes a most disagreeable acrid impression in the back of the throat; it may be made into pill with conserve of roses or liquorice powder, or one or two minims may be added to any of the common purgative pill masses, and thus given in divided doses until it operates.—*Sapo Crotonis*, (Croton oil, 2 parts; liquid caustic soda, 1 part). Dose, gr. i. to gr. iij.

Elaterium, D. L. E. *Elaterium. The fruit, fecula and leaves*, D.—*the fresh fruit*, L.—*the feculence of the juice of the fruit*, E., *of*

*Momordica Elaterium (Ecbalium agreste).* The Wild or Squirting Cucumber, is a native of Greece, and other parts of the South of Europe, and is cultivated in the British isles; it belongs to the Natural family *Cucurbitaceæ,* and to the Linnæan class and order *Monœcia Monadelphia.*

Botanical Characters.—An annual, trailing plant, with a thick branching stem about two feet in length; grayish, rugose leaves, and yellow, axillary flowers; Fruit *(Pepo,)* is about an inch and a half long, elliptical, green, covered with soft prickles; on quitting the foot-stalk when ripe, it suddenly, in consequence of the elastic structure of its parietes discharges with considerable force many brown seeds and a slimy juice through the aperture at its base.

Preparation.—The juice of the cut fruit when ripe (not quite ripe, *Edin.),* is expressed gently through a fine hair-sieve, allowed to rest till it becomes pretty clear, the supernatant liquid rejected, and the feculence dried with a gentle heat; this constitutes the *Extractum Elaterii,* D. L., *Elaterium,* E.

Physical Properties.—Elaterium is in thin, flat or slightly curled, pieces or fragments, light and friable; of a pale, greenish-gray colour, with a very faint odour, but an intensely acrid, and bitter taste; the pieces generally bear on the surface an impression of the linen on which they have been dried. An inferior quality, sometimes met with, is of a brownish or dark green colour, very hard, and broken with difficulty.

Chemical Properties.—According to Hennell's analysis, elaterium consists of a crystallized substance *(Elaterin),* green resin, starch, woody fibre, and saline matters; Elaterin, the active principle of the drug, may be obtained by exhausting elaterium thoroughly with boiling rectified spirit, concentrating this solution, so long as no separation takes place, and then pouring it while hot into a weak boiling solution of potash; on cooling, the elaterin crystallizes in minute, colourless, satiny crystals; the quantity obtained varies, in proportion to the quality of the drug employed, from 5 to 26 per cent.

*Adulterations.*—Elaterium is seldom expressly adulterated, but it varies much in strength, owing probably to the different degrees of care bestowed on its preparation; the best test for ascertaining its goodness is the process given above for obtaining its active principle; the quantity of *elaterin* thus procured "should weigh from a seventh to a fourth of the elaterium," *Ed. Ph.*

Therapeutical Effects.—Elaterium is a most powerful drastic cathartic, even in minute doses, 1-16th of a grain sometimes producing considerable purging, and 1-4th of a grain, in dropsical cases, generally causing a discharge of several pints of fluid by the bowels; its operation is characterized by nausea, sometimes vomiting, and considerable depression of the circulatory and nervous systems. The chief use of elaterium is in passive dropsies, especially ascites and hydrothorax, when it is deemed advisable to attempt the removal of the effused fluid by the bowels. It will be also generally found, that diuresis is more freely established after the operation of elaterium. The administration of elaterium requires the greatest caution in debilitated habits.

Dose and Mode of Administration.—1-16th to 1-4th of a grain in pill, (it should be always given at first in small doses), in combination with some tonic extract, as of gentian or chamomile.—*Pulvis Elaterii compositus,* (Elaterium, gr. iv.; bitartrate of potassa, ℈v.; ginger, ℈ij; mix; thirty-six grains contain one gr. of elaterium). Dose, gr. v. to gr. x.—*Tinctura Elaterii,* (Elaterium, gr. viij.; rectified spirit, f℥viij.; dissolve). Dose, f℥ss. to f℥ij.—*Solutio Elaterinæ,* morries stirling. (Elaterin, gr. j.; rectified spirit, f℥i.; nitric acid, min. iv.; dissolve). Dose, min. xxx. or min. xl.

In poisoning with elaterium, the same treatment should be followed as in poisoning with gamboge.

Euphorbia Lathyris.—*Caper-spurge.* An indigenous biennial, belonging to the Natural family *Euphorbiaceæ,* and to the Linnæan class and order *Monœcia Monandria.* It is not officinal in any of the British Pharmacopœias, but an oil obtained from the seeds has been introduced into the Paris Codex, as a cheap and efficient substitute for croton oil; it is obtained by simple pressure from the ripe seeds, 44 parts of oil being obtained from 100 parts of the seeds. It is very fluid, of a clear yellow colour, with an acrid taste and a peculiar odour. It is soluble in ether, but insoluble in alcohol.

Calderini, an Italian physician, has used it extensively; he says that its effect is certain and prompt; and that it may be considered as a mild cathartic, not producing either vomiting, colic or tenesmus. It is adapted for all cases, in which it is desirable to purge gently but effectually, and with a small dose of medicine. This oil is worthy of more observation than has been hitherto bestowed on it, as being likely to afford an excellent indigenous cathartic. The dose is from min. iv. to min. viij., it may be administered in syrup.

When applied externally, it possesses rubefacient properties similar to those of croton oil.

Helleborus, L. E. Helleborus niger, radix, D. *Root of Helleborus niger; Black Hellebore, or Christmas-rose,* D. E. *Root of Helleborus officinalis, Oriental or Officinal Hellebore,* L. The black hellebore, the Melampodium of the ancients, a native of the middle and southern parts of Europe, belongs to the Natural family *Ranunculaceæ,* and to the Linnæan class and order *Polyandria Polygynia.*

Botanical Characters.—Herbaceous; Leaves all radical, pedatisect; Scape leafless, one to two flowered; Flowers large, white.

Preparation.—The root should be dug up in February, after the plant is done flowering, and dried quickly.

Physical Properties.—As met with in the shops the root consists of two parts, a black root-stock, and numerous undivided fibres or radicals which arise from it; the latter are the active part and should only be used. They are cylindrical, about the thickness of a crow-quill,

brownish-black externally, whitish within, brittle; they have a faint unpleasant odour, and a somewhat acrid, bitter taste, but the acridity is much lost by drying.

Chemical Properties.—Black hellebore root contains a volatile oil, an acrid volatile acid, and other unimportant substances. Both water and alcohol extract its active properties, which probably depend on the volatile acid.

*Adulterations.*—Various other roots are substituted for, or intermixed with, black hellebore root on the continent; but in consequence of the limited employment of the drug, the fraud is not practised in this country. The root should be constantly renewed, as it loses its medicinal properties by keeping.

Therapeutical Effects.—This substance is classed among the vegetable irritant poisons, but in medicinal doses it operates as a drastic cathartic; and although little esteemed in modern practice, it was highly prized by the ancients, as a purgative in cerebral and nervous disorders and in dropsy; it was also said to possess emmenagogue and anthelmintic properties.

Dose and Mode of Administration.—In powder gr. iij. to gr. xij.—*Tinctura Hellebori*, D. L. (Black hellebore root, in coarse powder (bruised, L.), ℥iv. (℥v., L.); proof spirit, *by measure* ℔ij. (Oij., L); macerate for 7 (14, L.) days and strain). Dose, f℥i. to f℥ij.

### Hydrargyrum cum creta, D. L. E.—*Mercury with chalk.*

Preparation.—*Dub.*—"Take of purified mercury; and manna, of each, two parts; precipitated chalk one part; triturate the mercury and manna in an earthenware mortar, adding a few drops of water to give the mass the consistence of syrup; as soon as the globules disappear, add with constant trituration an eighth of the chalk; all being well mixed add 16 parts of water, agitate, and after resting, when the sediment falls, pour off the liquor; let the washing be repeated again and a third time, so as to remove all the manna, mix with the moist powder the rest of the chalk, and dry on blotting paper." *Lond. Edin.*—"Triturate together mercury, ℥iij., and prepared chalk, ℥v., till the globules disappear." In the Dublin formula, the manna is employed to effect the minute division and oxidation of the mercury.

Physical Properties.—A greyish, heavy, insoluble powder; void of odour, but having an astringent, metallic taste.

Chemical Properties.—According to the recent investigations of many celebrated chemists, this preparation appears to consist of metallic mercury in a state of minute division, suboxide of mercury, and carbonate of lime combined mechanically; but in what proportion the metal and oxide exist has not been yet ascertained. On the addition of the stronger acids to the powder effervescence takes place; and by exposure to heat the mercury is volatilised.

Therapeutical Effects.—A gentle cathartic and alterative, peculiarly adapted for infancy and childhood, promoting and improving the secretions of the liver, pancreas, and intestines. In combination with rhubarb, it is employed with much benefit in the diarrhœa of

children when the stools are clay-coloured, and when there is acidity of the primæ viæ. Prescribed with dried carbonate of soda, it is our most useful alterative in the cutaneous affections of infancy and childhood.

Dose and Mode of Administration.—In powder, gr. ij. to gr. v., for children; it is seldom prescribed for adults, the dose would be from gr. x. to 3ss.

Incompatibles.—The mineral acids; acetic acid; alum; and all sulphates.

Hydrargyrum cum Magnesia, D.—*Mercury with Magnesia.*

Prepared in a similar manner to the last, carbonate of magnesia being employed instead of prepared chalk. Its properties would appear to be nearly similar, but it acts with greater certainty as a cathartic, and is consequently to be preferred in many cases.

Hydrargyri pilulæ, D. L. E.—*Pills of Mercury. Blue pill.*

Preparation.—"By triturating in a mortar, until the globules disappear, two parts of purified mercury, and three parts of conserve of red roses, and then adding one part of extract of liquorice (of liquorice root, L. E.), reduced to fine powder, and beating together until they are all incorporated."

Physical Properties.—A soft pill mass, of a dark blue colour.

Chemical Properties.—This preparation, like the two last, probably consists of metallic mercury in a state of minute division combined with the suboxide of mercury. Three grains of the pill contain one grain of mercury.

*Adulterations.*—If the pill mass be prepared with conserve of roses to which sulphuric acid had been added, as is sometimes done to brighten its colour, it will contain subsulphate of mercury which possesses very irritating properties. It may be detected by triturating the mass with boiling water, and adding to the filtered liquor solution of nitrate of baryta; if any sulphate be present, a white precipitate insoluble in nitric acid will be produced.

Therapeutical Effects.—Although blue pill is most generally employed to produce the specific effect of the mercurial preparations, in full doses it operates as a cathartic. In consequence of its general alterative powers, and the peculiar property it possesses of improving and stimulating the biliary secretions, it is commonly prescribed in combination with the different cathartic pill masses, particularly the compound extract of colocynth. Thus combined, taken at night, and followed by an active purgative draught in the morning, it is found especially useful in the milder forms of derangement of the biliary organs.

Dose and Mode of Administration.—Given alone as a cathartic, gr. xij. to gr. xx.; combined with other purgatives, gr. v. to gr. viij.

Jalapa, D. L. E. *Root of Convolvulus jalapa*, D., *of Ipomœa jalapa*, L.,—*of Ipomœa purga*, E. *Jalap.* The officinal jalap root is now well known to be obtained from the plant indicated by the London and Edinburgh Colleges under different specific names (more recently named *Exogonium purga*), and not from that adopted by the Dublin College. It is a native of Mexico and Vera-Cruz; and belongs to the Natural family *Convolvulaceæ*, and to the Linnæan class and order *Pentandria Monogynia*.

Botanical Characters.—Roots tuberous, incrassated; Stems, herbaceous, smooth, climbing; Leaves, greenish, alternate, petioled, cordiform; Flowers, large, one to three, on axillary peduncles; corolla, large, campanulate, white with a reddish-purple centre.

Preparation.—The root is dug up, at the time the young shoots begin to appear, and dried by exposure to the air, or suspended in net bags over a fire.

Physical Properties.—Jalap root is met with in commerce in pieces, varying much both in size and form. The entire tubers are ovoid, from the size of a nut to that of an orange, generally incised more or less deeply and in different directions; externally rugose, compact, dark brown; whitish or yellowish within, marked with concentric zones. The flat pieces are merely transverse slices of the entire tubers. The fracture of jalap root is marbled and compact, presenting many brilliant points, (resin); the odour is faint but very nauseating; the taste, nauseous and acrid. It is pulverised with difficulty.

Chemical Properties.—Jalap is composed of hard and soft resin, bitter extractive, gummy extractive, albumen, uncrystallizable sugar, gum, mucilage, starch, and colouring matter. The resin, its active principle, exists in the proportion of from ten to fourteen per cent, it is soluble in alcohol, while water dissolves only the non-cathartic components of the root. The starch is often eaten by insects, such pieces are said to be worm-eaten, they are the most active as they contain in proportion to their weight more resin. Jalap resin is of a slightly yellow colour, odourless and tasteless when pure; insoluble in water or ether, but readily soluble in alcohol. It assumes a beautiful crimson colour when moistened with strong sulphuric acid, and allowed to stand for a quarter of an hour.

*Adulterations.*—Jalap root, as met with in English commerce, can be scarcely said to be adulterated; at one time slices of white Bryony root were mixed with it, but the white colour and intense bitterness of the spurious root rendered the fraud easy of detection. On the Continent many forms of spurious or counterfeit jalaps are met with mixed with the true root; they may, for the most part, be distinguished by being very rugose, of a reddish or rose colour internally, not compact, with a faint odour, and almost insipid. The purity of jalap resin may be readily ascertained by its action with sulphuric acid, as the beautiful crimson colour above described is not manifested if any other resin be present.

Therapeutical Effects.—Jalap is a powerful cathartic, operating principally upon the small intestines; administered in too large a dose, it causes violent hypercatharsis and inflammation. In medicinal doses it is

certain in its operation, increasing the peristaltic action and promoting the secretions and exhalations of the alimentary canal without causing any irritation; consequently it is frequently and beneficially prescribed for children. Its chief use as a cathartic, is in simple constipation without inflammation, in ascites, in scrofulous affections, and in verminous diseases; in the two latter, it is beneficially combined with calomel; in dropsy, with cream of tartar. It sometimes produces salivation, if its use be long persisted in. Jalap produces purging if applied to a wound or to the surface of the body, the cuticle having been previously removed by means of a blister.

Dose and Mode of Administration.—In powder, gr. x. to gr. xxx., for an adult; gr. ij. to gr. viij., for children; it may be given made into a bolus, or suspended in water or any simple decoction.—*Pulvis Jalapæ compositus*, D. L. E. (Jalap powder, ℔ss. (℥iij., L.; ℥i., E.); bitartrate of potash, ℔j. (℥vi., L. ℥ij., E.); (ginger, ʒij. L.); rub to very fine powder, and mix). Hydragogue cathartic; Dose, ʒss., to ʒiss.—*Extractum Jalapæ*, D. L. (Jalap root, bruised (powdered, L.), ℔i. (℔iiss., L.); rectified spirit, *by measure* ℔iv. (cong. j., L.); water (distilled, L.), cong. j. (cong., ij. L.); macerate in the spirit for four days, and pour off the tincture; boil down the residue in the water to ℔ij. (cong. ss. L.); then strain the tincture and the decoction separately, evaporate the latter, and distil the former until each thickens; lastly, mix the extract with the resin, and (evaporate in a water bath, D.), to a proper consistence; "this extract should be kept *soft* to form pills, and *hard* for powdering," L.). Dose, gr. x. to ϑi.—*Extractum sive Resina Jalapæ*, E. (Take any convenient quantity of jalap in moderately fine powder; mix it thoroughly with enough of rectified spirit to moisten it well; put it in 12 hours into a percolator and exhaust the powder with rectified spirit; distil off the greater part of the spirit and concentrate the residuum over the vapour bath to a due consistence). This is the impure resin; the dose is from gr. iij. to gr. x.; it should be given in a state of minute division, for which purpose it may be rubbed with sugar or some mild powder, or made into an emulsion with milk, sugar, and almonds.—*Sapo Jalapinus*, Pr. (Castile soap; and jalap resin, equal parts; rectified spirit, q. s.; dissolve and evaporate with a gentle heat to the consistence of a conserve). Dose, gr. xij. to ϑi., for adults; gr. iij. to gr. vj., for children.—*Tinctura Jalapæ*, D. L. E. (Jalap, in coarse powder (bruised, L.), ℥viij. (℥x., L. ℥vij., E.); proof spirit, *by measure* ℔ij. (Oij., L. E.); macerate for 7 (14, D. L.) days, and strain; "or may be prepared by percolation," E.). Dose, fʒj. to fʒiv.

Linum catharticum, E.—*Purging-flax*. A slender indigenous annual from two to six inches high, with small white flowers drooping before expansion. It belongs to the Natural family *Linaceæ*, and to the Linnæan class and order *Pentandria Monogynia*. The whole herb is officinal, it is void of odour, but has an intensely bitter taste. It was formerly held in high esteem as a cathartic and diuretic; at present it is never used in regular practice, and has been only retained in the Edinburgh Pharmacopœia on the authority of Dr. Christison, as a useful indigenous

cathartic in doses of a drachm of the powder, or an infusion of two or three drachms of the herb.

Magnesia. *Magnesia* (described in the division *Antacids*), given in full doses operates as a gentle cathartic; its effect, however, being by no means uniform or certain, depending probably on the quantity of free acid in the stomach, by union with which it forms soluble magnesian salts. It does not increase the secretions of the intestines, but by stimulating their muscular fibres, causes the evacuation of their contents. Magnesia is very generally employed as a purgative in infantile diseases, and by females and persons of a delicate habit of body; it is most usually combined with rhubarb, a combination frequently employed and with much benefit in the early stages of diarrhœa, particularly when dependant on irritation or acidity of the primæ viæ. Magnesia when taken for a long period has in some instances accumulated to a *great extent*, and even formed concretions in the bowels. When therefore, it is thought advisable, to continue its use for any time, it will be necessary to administer an active cathartic occasionally. Dose, ℈i. to ʒi. for adults; gr. ij. to gr. x. for children.

Magnesiæ carbonas. *Carbonate of Magnesia* (described in the division *Antacids*), is a still milder cathartic, it is employed in the same cases, but is used less frequently than magnesia, in consequence of its producing flatulence from the disengagement of carbonic acid in the stomach. Dose, ʒi. to ʒij. for adults; gr. x. to ℈i. for children. A mildly laxative effervescing draught may be prepared with a drachm of carbonate of magnesia, the juice of one lemon, and a wine glassful of water.

Magnesiæ sulphas, D. L. E. *Sulphate of Magnesia. Epsom Salts.*

Magnesiæ sulphas purum, D. *Pure Sulphate of Magnesia.*

Preparation.—An article of the Materia Medica; it was formerly prepared by evaporating the waters of the Epsom springs; at present a variety of processes are followed by different manufacturers, which it would be out of place to enter into any account of here. The process of the *Dub. Ph.* for preparing the pure salt, as it is there termed, is as follows:—"Take of commercial sulphuric acid, 25 parts; water, 100 parts; carbonate of magnesia, 24 parts, or a sufficiency; to the acid and water mixed, add gradually the carbonate of magnesia; lastly, evaporate the filtered liquor that crystals may form on cooling."

Physical Properties.—Usually met with, in small acicular crystals, transparent and colourless; inodorous; with an extremely bitter, disagreeable taste. By slow crystallization tolerably large crystals are readily obtained, their form is, the four-sided rhombic prism with reversed dihedral summits, or four-sided pyramids. Sp. gr. 1·66.

Chemical Properties.—It is composed of 1 eq. of magnesia, 1 of acid, and 7 of water, ($MgO, SO^3, HO + 6HO$). It is permanent in the air, but in a slightly increased temperature effloresces, losing 6 eq. of water at a temperature considerably under 300°, first fusing in its water of crystallization; if the temperature be raised still higher it becomes anhydrous, and undergoes the igneous fusion, but is not decomposed. It dissolves in its own weight of water at 60°, and in three-fourths of its weight of boiling water. It is insoluble in alcohol.

*Adulterations.*—At present this salt is met with in a state of great purity; sometimes, however, when prepared from bittern it contains chloride of magnesium, which being very deliquescent, is readily recognised. On the continent in the present day, and formerly also in this country, crystals of sulphate of soda, which is a much cheaper salt, are fraudulently mixed with those of sulphate of magnesia; the sophistication is best detected by the test of the *Ed. Ph.* which is intended to show, that the full proportion of magnesia is present:—"ten grs. dissolved in f℥i of water, and treated with solution of carbonate of ammonia, are not entirely precipitated by 280 minims of solution of phosphate of soda, (1 of salt, to 20 water)."

Therapeutical Effects.—Sulphate of magnesia is a refrigerant cathartic, operating mildly but effectually, augmenting the secretions and promoting the peristaltic action of the intestinal canal; the evacuations are watery, and are not accompanied with either nausea or griping. It is consequently more generally employed at present, than perhaps any other medicine of this class; it has also the advantage of great cheapness. This salt is peculiarly adapted for all forms of febrile and inflammatory affections, especially when accompanied by constipation. In short, there are but few diseases in which cathartics are indicated, that it may not be employed with benefit. Sulphate of magnesia forms the active ingredient in many mineral waters.

Dose and Mode of Administration.—℥ij. to ℥j. dissolved in seven or eight times its weight of water. Its cathartic properties are promoted by dilution, therefore a smaller dose than usual, will suffice, if dissolved in a large quantity of water; tincture of some aromatic bitter, as of cascarilla, calumba, orange peel, &c. is added with advantage to the solution to conceal its nauseous taste; this is best done, however, by the addition of ten or twelve minims of dilute sulphuric acid, or by administering the salt in the acid infusion of roses, an elegant and beneficial form in febrile diseases.—*Pulvis Salinus compositus,* D. E. (Pure muriate of soda; and sulphate of magnesia, of each, ℥iv.; sulphate of potash, ℥iij.; dry the salts with a gentle heat, and pulverise them separately; then triturate them well together, and keep in a well-closed vessel). Dose, ℥ij. to ℥ss. dissolved in Oss. of water. In the preparation of this powder, instead of the sulphate of potash, I have employed ℥iv. of sulphate of soda, and found the resulting compound a more effectual cathartic in smaller doses; ℥i. dissolved in half a pint of water, and taken in the morning before breakfast, operating freely, and with perfect safety.—*Enema Catharticum,* D. (Manna, ℥i.; dissolve in ten fluid ounces of compound decoction of chamomile, and add, olive oil ℥i.; and sulphate of magnesia, ℥ss.):—E. (Olive oil, ℥i.; sulphate of magnesia, ℥ss.; sugar, ℥i.; senna, ℥ss.;

boiling water, f℥xvj.; infuse the senna in the water for an hour; then dissolve the salt and the sugar, and add the oil). A useful cathartic enema for general purposes.

Incompatibles.—The alkalies, and their carbonates; lime water; muriate of ammonia; chloride of calcium; muriate of baryta; the acetates of lead; and nitrate of silver. The bicarbonates of the alkalies are not incompatible with sulphate of magnesia, unless at the temperature of boiling water.

Manganesiæ sulphas. *Sulphate of Manganese.* This salt which is left as the residue in the preparation of oxygen gas by heating together black oxide of manganese and sulphuric acid, acts as a cathartic when administered in doses of from one to six drachms dissolved in a large quantity of water. It seems to stimulate the parenchymatous viscera of the abdomen, particularly the liver, to increased secretion, as the evacuations caused by it contain a large quantity of bile. It is rarely used at present, but has been recently brought under the notice of the profession by Dr. Ure of London, as likely to prove a useful purgative in gouty affections. It should be always combined with some other cathartic, as with senna, for if given alone it is apt to produce vomiting.

Manna, D. L. E. *Concrete juice of Fraxinus ornus,* D.—*Of Ornus Europæa,* L,—*Sweet concrete exudation, probably from several species of Fraxinus, and Ornus,* E. Nearly all the species of the genera Fraxinus and Ornus yield manna, but the greater portion of what occurs in commerce is obtained from the Fraxinus rotundifolia; a native of the South of Europe, chiefly of Sicily and the South of Italy. It belongs to the Natural family *Oleaceæ,* and to the Linnæan class and order *Diandria Monogynia.*

Botanical Characters.—Fraxinus ornus is a small tree; Leaves, opposite, pinnate; Panicles, large, many flowered; Flowers, small polygamous, white; the whole tree resembles much in appearance the common ash of our climate.

Preparation.—The juice of the stem exudes spontaneously either from fissures in the bark, through punctures made by insects, or more usually from incisions made expressly with a hooked knife. It concretes rapidly on the tree, and is then removed by the hand.

Physical Properties.—Two sorts are commonly met with in the shops. 1st.—Flake manna, *Manna cannellata;* it occurs in stalactiform pieces, from one to six inches in length, and one or two inches in width, uneven, rugged, porous and friable; of a dull yellowish-white colour; presenting a furrow on the surface by which they adhered to the tree, on which side they are usually somewhat soiled; it has a faint, somewhat nauseous odour, and a sweetish insipid taste. 2nd.—Fatty manna, *Manna pinguis;* it is in soft, viscid, fragments of a brownish-yellow colour, much soiled and mixed with impurities; its odour is very nauseous, and its taste viscid and disagreeable.

Chemical Properties.—Manna consists of a peculiar saccharine principle named *Mannite,* uncrystallisable sugar, gummy matter, nitrogenous matter and moisture; it contains about 40 per cent of mannite and about 10 per cent of sugar. It softens with the heat of the hand, and melts at a temperature a little higher; it is soluble in three parts of water at 60°, and in eight parts of rectified spirit. Mannite, its active principle may be obtained by boiling manna in alcohol, and pouring off the spirit, from which as it cools the mannite is deposited in crystals.

Flake manna, which is alone employed in medicine, is not liable to adulteration.

Therapeutical Effects.—Manna is a very mild laxative, employed only in the diseases of children and delicate females; in the present day it is seldom administered alone, being generally used for sweetening cathartic mixtures. When first gathered, manna does not possess any laxative properties, and is employed as a nutritive article of diet in the countries where it is produced. Manna, when it has become hard from keeping, is an excellent basis for forming the more active medicines into pills.

Dose and Mode of Administration.—For children, ʒi. to ʒss., for adults, ʒi. to ʒij.—*Mannite,* for children, ʒss. to ʒij., for adults, ʒss. to ʒi.

Mel, D. L. E. *Juice extracted from flowers, and prepared by the Bee,* L. *Saccharine secretion of Apis mellifica,* E. *Honey.* Honey is secreted by the nectaries of most flowers, from whence it is collected by the Bee, an insect belonging to the order *Hymenoptera;* in the honey bag of the insect, which is a dilatation of the œsophagus, it probably undergoes some alteration previous to its deposition in the cells of the honey-comb. Honey is too well known to require any description; it is composed of grape-sugar, cane-sugar, mannite, acetic acid, aromatic principle, wax, &c. It is sometimes adulterated with sand, with starch, or with wheaten or pea flour; the first adulteration may be detected by dissolving in water; the others by the action of tincture of iodine on the cooled decoction, which is rendered blue if any fecula be present. Dissolved in a large quantity of water, honey possesses demulcent and cooling properties; in a small portion of water it operates as a mild laxative. It is now but little used in medicine; nevertheless, eaten at breakfast it is found very beneficial by persons liable to habitual constipation. Honey has in some instances proved poisonous, in consequence of having been collected by the bees from poisonous flowers. By melting honey in a vapour bath and removing the scum, Clarified honey, *Mel Despumatum,* D., is prepared. Both the flavour and odour of honey are injured by this process.

Olivæ oleum, D. L. E. *Oil expressed from the fruit, (of the pericarp,* E.), *of Olea Europœa.* This tree, originally a native of Asia

Minor, now grows freely on the borders of the Mediterranean, and is cultivated all over the south of Europe, especially in Provence. It belongs to the Natural family *Oleaceæ*, and to the Linnæan class and order *Diandria Monogynia*.

Botanical Characters.—A moderately sized tree with hard, veined, wood; Leaves, in pairs, acute, hoary beneath, giving a whitish character to the foliage; Flowers, small, white; Drupe, elliptical, dark-bluish-green, with a hard nut generally one seeded.

Preparation.—The finer sorts of the oil are obtained by simply pressing the fresh, ripe, fruit in a mill; a second sort, by moistening the marc, left after the first expression, with boiling water and repressing it; and a third and very inferior sort by boiling this cake in water, and submitting it to very strong pressure.

Physical Properties.—Olive oil is a transparent, unctuous fluid, of a yellow colour, pale or greenish according to quality, (the finer sorts being of a lighter shade); when good, odourless, with a bland, oily, taste; by keeping it acquires both a rancid odour and taste, more slowly however than the other fixed oils. Sp. gr. ·911 at 77° F.

Chemical Properties.—It is composed of 72 parts of *elaine*, and 28 of *margarin*. Olive oil readily saponifies; exposed to the air, even in thin layers, it thickens but does not dry. It congeals at 36° F.; is insoluble in water or in alcohol, but at 59° it dissolves in once and a half its weight of ether.

*Adulterations.*—Cheaper vegetable oils, as poppy oil and rape-seed oil, are commonly employed to adulterate olive oil. The best test for ascertaining its purity is that of Poutet, adopted in the last edition of the Edin. Phar.; "mix with a twelfth of its volume of solution of nitrate of mercury, prepared by dissolving with a gentle heat ʒiv. of mercury in fʒixss. of nitric acid (density 1380 to 1390); if pure it becomes in three or four hours like a firm fat, without any separation of liquid oil." For ordinary purposes the presence of other fixed oils may be more readily ascertained, by shaking the oil in a bottle half filled, when if it be pure the surface of the oil soon becomes smooth by repose, but if it be adulterated, a number of air bubbles, *beads*, remain.

Therapeutical Effects.—It is seldom given by the mouth as a cathartic, but forms an admirable addition to *laxative enemata*, in inflammation or spasms of the intestines, in dysentery, or in irritation of the urino-genital organs.

Dose and Mode of Administration.—fʒi. to fʒij. by the mouth; fʒij. to fʒiv. in an enema with decoction of barley.

## Potassæ acetas, D. L. E. *Acetate of Potash.*

Preparation.—*Dub.*—"Add gradually to any quantity of carbonate of potash prepared from crystals of Tartar, about five times its weight of distilled vinegar of a medium heat; when the effervescence shall have ceased, and the liquor have given off vapours for some time, add by degrees distilled vinegar, until all effervescence shall cease; the dry salt produced by evaporation, is to be liquefied by cautiously raising the heat; dissolve the cooled salt in

water, filter and evaporate, until it becomes on cooling a white crystalline mass; keep in well-closed bottles." The London and Edinburgh Colleges direct it to be prepared by dissolving; the former, ℔j. of carbonate of potash in, acetic acid, f℥xxvi., and distilled water, f℥xij.; the latter, ℥vij. or a sufficiency of dry carbonate of potash in Oiss. of pyroligneous acid, so as to neutralize it, straining and evaporating with a cautious heat the liquor, so as to obtain on cooling a crystalline mass.

Physical Properties.—Masses of white, needle-shaped, satiny crystals, odourless when dry, but emitting a faint acetous odour when moistened; they have a pungent, somewhat acrid but cooling taste; and are soapy to the touch. Sp. gr. 2·10.

Chemical Properties.—It is composed of 1 eq. of potassa, and 1 of anhydrous acetic acid, (KO, $C^4H^3O^3$); it deliquesces on exposure to the air, and is very soluble both in water, and in alcohol; by heat it is fused, and if the heat be increased is decomposed, *pyroacetic spirit* being driven off and *carbonate of potash* left.

This salt is not liable to adulteration; it should be snow-white.

Therapeutical Effects.—Scarcely ever used as a cathartic, nevertheless in sufficient doses it operates effectually, producing watery evacuations, and is therefore, independent of its diuretic properties, well adapted for dropsical diseases.

Dose and Mode of Administration.—As a cathartic, ℥ij. to ℥iij., dissolved in a large quantity of water.

Incompatibles.—The mineral acids, and their soluble salts; and tartaric acid.

## Potassæ bisulphas, D. L. E. *Bisulphate of Potash.*

Preparation.—*Dub.*—"Commercial sulphuric acid, two parts; carbonate of potash from potashes, a sufficiency; water, six parts; saturate the carbonate of potash with one part of the sulphuric acid mixed with the water, then add the other part of the sulphuric acid, and evaporate the liquor so that crystals may form by cooling." *Lond. Edin.*—"Take of the salt which remains after the distillation of nitric acid, ℔ij.; sulphuric acid (of commerce, E.), ℔j. (f℥vij. f℥i., E.); boiling water, Ovj.; dissolve the salt in the water, add the acid, and mix. Then concentrate the solution, and set it aside, that crystals may be formed."

Physical Properties.—In minute, transparent crystals which belong to the right prismatic system; odourless, with a very acid and bitter taste. Sp. gr. 2·163.

Chemical Properties.—It is composed of 2 eq. of sulphuric acid, 1 of potassa, and 1 of water, (HO, $SO^3$ + KO, $SO^3$); the excess of acid acting upon metals and alkaline bases very much as if it were free. The crystals are permanent in the air, and are soluble in about twice their weight of water at 60°; the solution has a strongly acid reaction. By a red heat, the water of crystallization and half the acid are expelled, and sulphate of potash remains.

Therapeutical Effects.—Rarely employed in medicine; it operates as a mild cathartic, and as its after effects are tonic, it may be used with

advantage in debilitated habits; combined with rhubarb it conceals much of its nauseous taste, and promotes its cathartic properties. Dr. Barker proposed a solution of 73 grs. of this salt, mixed with a solution of 72 grs. of carbonate of soda as a cheap effervescing purgative draught, but it forms an extremely nauseous compound.

Dose and Mode of Administration.—3ss. to 3iss. dissolved in from f℥iij. to f℥vj. of water.

Incompatibles.—Alkalies; earths, and their carbonates; metallic salts; and tartaric acid.

Potassæ bitartras, D. L. E. Tartari crystalli, D. *Bitartrate of Potash; Crystals of Tartar; Crude Tartar; Cream of Tartar.*

Preparation.—Bitartrate of potash is an article of the Materia Medica; it is obtained by dissolving and recrystallizing *argol*, an obscurely crystalline substance, which concretes on the inside of casks in which new wine has been kept; this constitutes the *crystalli tartari* of the *Dub. Phar.* A purer salt is procured by redissolving these crystals, evaporating the solution slowly, and removing the crust as it forms on the surface, whence the name *cream of tartar.*

Physical Properties.—This salt is met with in the form either of a fine white powder, or a semi-transparent crystalline mass, the crystals being oblique rhombic prisms; it is without odour, but has an agreeable acid taste. Sp. gr. 1·953.

Chemical Properties.—It is composed of 1 eq. of potassa, 2 of tartaric acid, combined in the crystalline state with 1 of water, (HO, KO, $H^4C^8O^{10}$); it is unalterable in the air, is soluble in 184 parts of water at 68°, and in 18 parts of boiling water, the solution having a strongly acid reaction, By heat the salt is decomposed, and converted into a compound of charcoal and carbonate of potash, *(Black Flux).*

*Adulterations.*—This salt in the state of powder is very much adulterated; the substances commonly employed for this purpose are, finely powdered marble, alum, bisulphate of potash, and wheaten flour or starch. The tests of the *Ed. Ph.* will detect any of these impurities; "Entirely soluble in 40 parts of boiling water. Grs. xl. in solution are neutralized with gr. xxx. of crystallized carbonate of soda; and when then precipitated with gr. lxx. of nitrate of lead, the liquid remains precipitable by more of the test."

Therapeutical Effects.—In full doses, cream of tartar operates as an active cathartic, producing many watery evacuations without much irritation. It is seldom prescribed singly, but, in general, with some of the milder vegetable cathartics. Thus, combined with sulphur in the form of electuary, it is an exceedingly useful purgative in hemorrhoidal affections and in skin diseases; and with jalap, it forms an excellent cathartic in dropsies.

Dose and Mode of Administration.—3iij. to 3vj. made into an electuary with honey or treacle. Its solubility in water may be much increased, without impairing its medicinal activity, by adding to it a fourth of its weight of boracic acid.—*Effervescing aperient with cream*

*of tartar;* (Cream of tartar, ʒiij.; carbonate of soda, in crystals, ʒiiss.; water, fʒviij). For one dose.

Incompatibles.—The mineral acids; the alkalies; lime water; the carbonates of potash and of soda; acetate of lead; and magnesia, and its sulphate.

### Potassæ sulphas, D. L. E. *Sulphate of Potash.*

Preparation.—*Dub.*—"Dissolve the salt which remains after the distillation of nitric acid in a sufficiency of water; add of carbonate of potash from potashes, sufficient to saturate the superabundant acid; evaporate the filtered liquor that crystals may be formed." *Lond.*—"Take of the salt which remains after the distillation of nitric acid, ℔ij.; boiling water, cong. ij.; ignite the salt in a crucible until the excess of sulphuric acid is entirely expelled, then boil it in the water until a pellicle floats, and the liquor being strained, set it aside that crystals may be formed. The liquor being poured off, dry them." *Edin.*—"Take of the residuum of the preparation of pure nitric acid, ℔ij.; boiling water, cong. ij.; white marble in powder, a sufficiency. Dissolve the salt in the water; add the marble gradually till effervescence ceases, and the solution is completely neutralized; filter the liquid, and evaporate it till a pellicle forms on its surface; then set it aside to cool and form crystals."

Physical Properties.—A solid white salt, crystallizing usually in single or double six-sided prisms, terminated by six-sided pyramids; inodorous, with a slightly bitter saline taste. The crystals are very hard, and are therefore employed in pharmacy for triturating and dividing vegetable powders. Sp. gr. 2·4.

Chemical Properties.—It is composed of 1 eq. of potassa, and 1 of sulphuric acid, ($KO, SO^3$); is unalterable in the air; heated it decrepitates, and at a strong red heat fuses, but is not decomposed; it requires 9 parts of water at 60°, and 5 of boiling water for its solution, but is insoluble in alcohol.

*Adulterations.*—Sulphate of potash is seldom adulterated in this country; on the continent, however, it has been often found to contain sulphates of copper, of zinc or of iron, and in some instances corrosive sublimate. The best tests of its purity are, the neutrality of the solution and its not precipitating with gallic acid, with ammonia, with hydrosulphate of ammonia or with sulphate of silver.

Therapeutical Effects.—In doses of from two to four drachms, this salt has occasionally produced symptoms of irritant poisoning; it is nevertheless a mild cathartic generally operating effectually, and with scarcely any disturbance of the system, but on account of its little solubility it is not much employed alone. It is not adapted for children, as it is apt to produce vomiting if given to them even in a moderate dose. Sulphate of potash is an excellent purgative for females after delivery, when it is wished to diminish the secretion of milk.

Dose and Mode of Administration.—ʒi. to ʒiv. dissolved in warm water, or in powder combined with rhubarb.—*Potassæ sulphas cum sulphure,* E. (Nitrate of potash; and sulphur, equal parts; mix thoroughly, and project in small successive portions into a red-hot cruci-

ble; when the deflagration is over and the salt has cooled, reduce it to powder, and preserve in well-closed bottles). A mild cathartic, much more soluble than the plain sulphate. Dose ʒss. to ʒi.

Incompatibles.—Nitric, and muriatic acids; tartaric acid; chloride of calcium; chloride of barium; the acetate, and diacetate of lead; nitrate of silver; corrosive sublimate; and sulphate of magnesia.

### Potassæ tartras, D. L. E. *Tartrate of Potash.*

Preparation.—*Dub.*—"Carbonate of potash from potashes, 5 parts; bitartrate of potash, 14 parts; boiling water, 45 parts; to the carbonate of potash dissolved in water, add gradually the bitartrate of potash in very fine powder; evaporate the liquor, previously filtered through paper, and set it aside that crystals may be formed by cooling." *Lond. Edin.*—"Bitartrate of potash, in powder, ℔iij.; carbonate of potash, ʒxvj. (or a sufficiency, L.); boiling water, Ovi.; dissolve the carbonate in the boiling water, then add the bitartrate (till the liquor is neutralized, E.), and boil. Filter the liquor, and concentrate by boiling till a pellicle floats on the surface, and set it aside that crystals may be formed. The liquor being poured off, dry these, and again evaporate the liquor that crystals may be produced."

Physical Properties.—A solid, white salt, crystalline, but generally met with in the form of a granular powder; the crystals are small right rhombic prisms. It is inodorous, and has a cooling saline taste. Sp. gr. 1·556.

Chemical Properties.—It is composed of 1 eq. of potassa, and 1 of tartaric acid, (KO, $C^8H^4O^{10}$); it attracts moisture in a damp atmosphere, but does not deliquesce; exposed to heat it is decomposed, and converted into a compound of carbonate of potash and charcoal. It is soluble in an equal weight of cold water, whence the name *soluble tartar* is applied to it; it is likewise soluble in alcohol.

*Adulterations.*—This salt is not unfrequently adulterated with the bitartrate, which may be known by its not being soluble in its own weight of water at 50°. It also sometimes contains carbonate or sulphate of potash or chloride of potassium; any of which may be detected "by the precipitates occasioned in it by chloride of barium or acetate of lead not being soluble in dilute nitric acid;" *Lond. Ph.*

Therapeutical Effects.—A mild but efficient purgative, not much employed in the present day. By accelerating the operation of the resinous purgatives, it corrects their griping properties.

Dose and Mode of Administration.—ʒij. to ʒx. in solution.

Incompatibles.—All acids, and most acidulous salts; lime water; chloride of calcium; nitrate of silver; and acetate of lead.

### Pruna, L. E. Prunus domestica, fructus siccatus, D. *Prunes. The dried fruit of Prunus domestica.*

The plum tree, originally a native of Syria, is now cultivated extensively in the temperate regions of Europe, and in the British Isles; it belongs to the Natural family *Rosaceæ (Drupaceæ,* Lindley,) and to the Linnæan class and order *Icosandria Monogynia.* The fruit dried in the sun constitutes *prunes;*

they are imported principally from Bourdeaux. Prunes are mildly laxative, and are sometimes added to infusion of senna to conceal its nauseous taste. They enter into the composition of the electuary of senna of the pharmacopœias.

Rhamni baccæ, E. Rhamnus, L. Rhamnus catharticus baccæ, D. *Buckthorn berries. Fruit of Rhamnus catharticus.* An indigenous shrub, belonging to the Natural family *Rhamnaceæ*, and to the Linnæan class and order *Pentandria Monogynia.*

Botanical Characters.—Stems about ten feet high, branching, spiny; Leaves ovate, sharply serrated; Flowers small, yellowish-green, diœcious; Fruit, a berry.

Physical Properties.—The berries are about the size of peas, black, shining, four-seeded, with a green juicy parenchyma; they have an acrid, nauseous taste, and when bruised, emit a faint unpleasant odour. The juice is preserved in the form of syrup.

Chemical Properties.—The juice consists of a peculiar colouring matter, acetic acid, mucilage, sugar, and nitrogenous matter. The nature of its purgative principle is unknown. By evaporating to dryness the juice mixed with lime or with alum, the pigment, *sapgreen* is obtained.

*Adulterations.*—The berries of the *Rhamnus frangula* are often substituted for, or mixed with buckthorn berries, they may be detected by having only *two* seeds.

Therapeutical Effects.—The fresh berries or their expressed juice operate as powerful cathartics, producing many watery evacuations; but in consequence of the severity of their operation frequently accompanied by severe tormina, thirst, and distressing nausea, although in former days much vaunted in the treatment of dropsy, they are at present scarcely ever used.

Dose and Mode of Administration.—Of the fresh berries, 10 to 20.—*Syrupus Rhamni*, D. L. E. (Fresh juice of the berries, *by measure* ℔iiss. (Oiv., L. E.); ginger, sliced; and pimento, bruised (powdered, L.), of each, ʒiij. (ʒvj. L. E.); let the juice rest (for 3 days, L. E.), that the dregs may subside, and strain. Macerate for 24 (4, L. E.) hours the pimento and ginger in ℥x. (Oi. L. E.) of the strained juice, and filter; boil down the rest of the juice to ℔j. *by measure* (Oiss. L. E.), and with sugar (℔iv. L. E.) form the whole into syrup). Dose, f℥ss. to f℥i.

Rheum, D. L. E. *Rhubarb; Root of Rheum palmatum, and Rheum undulatum,* D.—*Root of Rheum palmatum,* L.—*Root of an undetermined species of Rheum,* E. The exact species of the genus Rheum, from which the different varieties of Rhubarb met with in commerce are obtained, is as yet unknown. They inhabit the northern regions of Asia, from the shores of the Caspian Sea to the Chinese wall,

and are cultivated in most of the countries of Europe. The genus is placed in the Natural family *Polygonaceæ*, and in the Linnæan class and order *Enneandria Monogynia*. Besides the species mentioned in the Pharmacopœias, the following have been referred to by different authorities as yielding rhubarb of one kind or another; viz.—*R. rhaponticum; R. compactum; R. Emodi; R. Webbianum; R. Spiciforme; R. Moorcroftianum; R. crassinervium; R. leucorrhizum, &c.*

Botanical Characters.—All the species are characterized by having a perennial root, which sends up annual root leaves, usually very large, deeply incised and wavy at the edges, generally cordate; a herbaceous flowering stem, from two to four feet high; Flowers small; calyx, petaloid, six-parted, withering.

Preparation.—The root is dug up when the plant is five or six years old, washed, scraped, and cut into various sized pieces to facilitate the drying; the pieces are then pierced, strung upon cords, and dried differently in various localities; sometimes on stone tables heated beneath by a fire, sometimes in the sunshine, sometimes slowly under sheds by a current of air, while in Tartary, the Moguls are said to hang them about their tents or on the horns of their sheep.

Physical Properties.—Three varieties of rhubarb are ordinarily met with in British trade, each of which we shall consider separately, viz.—Russian, Chinese or East Indian, and English Rhubarb.

1. Russian Rhubarb; *Turkey Rhubarb;* it is met with in irregular shaped pieces, from an inch to three inches in breadth, roundish, sometimes flattened on one side, angular, heavy, of a bright-yellow colour, without any traces of epidermis; generally perforated with conical, not cylindrical holes, in some pieces extending completely, in others only partially through their substance; internally they are compact, beautifully marbled with yellow, red, and white streaks or points. The odour is strong and peculiar; the taste is bitter and faintly astringent; chewed, it feels gritty under the teeth owing to the presence of crystals of the oxalate of lime, and it tinges the saliva yellow; it may be readily pulverized; the powder is of a bright yellow colour. This description of rhubarb is collected by the Bucharians on the mountains of Tartary, brought by them to the Russian town of Kiachta for barter, whence it is conveyed to St. Petersburgh, where it is sorted, packed into boxes or cases which are covered on the outside with a hide, and then exported to the different countries of Europe and to the British Isles.

2. Chinese, or East Indian Rhubarb, is met with in globular or flat pieces, rounded, not angular on the surface, of a brownish-yellow colour, usually presenting some traces of epidermis; somewhat heavier than Russian rhubarb; perforated with cylindrical holes, in many of which are found pieces of cord by which the roots were suspended while being dried; internally they are close and compact, marbled and spotted yellowish-brown and whitish; the odour is somewhat stronger than that of Russian rhubarb, the taste similar; the powder is not of so bright a colour. This description is the product of the northern provinces of China; it is imported in chests directly from Canton or by way of Singapore.

3. English Rhubarb. Two kinds are commonly met with.—1st.

*Stick Rhubarb;* which occurs in pieces, about five or six inches long, and half an inch in diameter, round, striated, of a dirty yellowish-brown colour externally, blackish internally with reddish streaks; its odour is faint, and its taste astringent, not gritty.—2nd. *Trimmed Rhubarb;* this sort is often sold for Turkey rhubarb, which it is prepared to represent; its texture, however, is in general soft and spongy, it has a pinkish hue, is mucilaginous, and is pulverised with difficulty; its taste is astringent, its odour faint, and it is not gritty under the teeth, containing but few crystals of oxalate of lime.

The following sorts of rhubarb are of such rare occurrence in the English market, that a mere mention of them will suffice:—*French rhubarb, Bucharian rhubarb, Siberian rhubarb, Canton-stick rhubarb,* and *Himalayan rhubarb.*

Chemical Properties.—According to the most complete analysis, that of Brandes in 1836, rhubarb consists of a peculiar principle, named by him *Rhabarberic acid (Rhein, Rheumin, Rhabarberin, Caphopicrite, Chrysophanic acid,* of other chemists), gallic and tannic acids, uncrystallizable sugar, starch, gummy extractive, colouring extractive, pectic acid, malate and gallate of lime, oxalate of lime, inorganic salts, silica, iron, and woody fibre. *Rhabarberic acid,* the active principle of rhubarb, was obtained by its discoverer in the proportion of 2 per cent in a pure, and 10 per cent in an impure form. Rhubarb yields its active principles to both cold and boiling water, to proof spirit, to alcohol, and to ether.

*Adulterations.*—The inferior sorts, especially British rhubarb, are frequently mixed with, or substituted for, the finer kinds; the fraud may be detected by attending to the characters given above for the different varieties. Powdered Turkey or East India rhubarb, is very generally adulterated with British rhubarb; the sophistication is difficult of detection, but the fresh powder of the finer sorts is always of a *bright* yellow colour.

Therapeutical Effects.—Rhubarb acts upon the whole tract of the digestive canal as a mild tonic, cathartic, and astringent. In small doses, it manifests its tonic properties only, promoting the digestive process as indicated by increased appetite and an improvement in the quality of the alvine secretions. In full doses, it operates as a mild cathartic, stimulating to increased activity the muscular coat of the whole of the intestinal canal, more especially that of the duodenum, but scarcely, if at all, augmenting the secretions. Its astringent property is manifested after the cathartic action has ceased, constipation usually following its purgative effects. The combination of these properties, as well as the safety and mildness of its operation, renders rhubarb a remedy of much value in many diseases. Thus in the treatment of the early stages of the *diarrhœa of irritation,* it is the most efficacious purgative we can employ; it is also peculiarly adapted as a cathartic for infancy and childhood, and as a general laxative for persons with enfeebled digestion, and in all cases of debility of the digestive organs. For the same reasons rhubarb is inadmissible in the treatment of febrile and inflammatory affections. Rhubarb is absorbed in the course of its operation, and its peculiar odour and yellow colouring matter may be recognised in the urine, in the sweat, in the serum of the blood, and in the milk of nurses, to the latter of which it imparts a purgative property.

Dose and Mode of Administration.—In powder, as a stomachic tonic, gr. v. to gr. x.; as a cathartic, ʒi. to ʒij. A few drops of the essential oil of nutmegs rubbed up with powdered rhubarb mask its disagreeable odour.—*Pulvis Rhei compositus*, E. (Magnesia, ℔i.; ginger, in fine powder, ℥ij.; rhubarb, in fine powder, ℥iv.; mix thoroughly, and preserve in well closed bottles). A useful antacid purgative, commonly known as *Gregory's powder;* Dose, for children, gr. v. to gr. xij.; for adults, ʒss. to ʒi.—*Extractum Rhei*, D. L. (Rhubarb, bruised (powdered, L.), ℔i. (℥xv. L.); proof spirit, *by measure* ℔j. (Oj., L.); distilled water, *by measure* ℔vij. (Ovij., L.); macerate for four days (with a gentle heat, L.), filter, and allow the dregs to subside; pour off the clear liquor and evaporate (when strained, L.) to a proper consistence).—E. (Rhubarb, ℔j.; water, Ov.; cut the rhubarb into small fragments, macerate for 24 hours in Oiij. of the water; filter through a cloth, express moderately; macerate the residuum with the rest of the water for 12 hours, filter with the same cloth as before and express the residuum strongly. The liquors, again filtered if necessary, are then to be evaporated to a proper consistence in the vapour bath). Dose, gr. x. to ʒss.—*Pilulæ Rhei*, E. (Rhubarb, in fine powder, 9 parts; acetate of potash, 1 part; conserve of red roses, 5 parts; beat into a proper mass). Dose, gr. v. to gr. xv.—*Pilulæ Rhei compositæ*, L. E. (Rhubarb, in fine powder ℥j. (12 parts, E.); aloes, powdered, ʒvj. (9 parts, E.); myrrh, powdered, ℥ss. (6 parts, E.); soap, ʒi. (6 parts, E.); (oil of caraway, f℥ss., L.; oil of peppermint, 1 part, E.); (syrup, q. s., L.; conserve of red roses, 5 parts, E.); mix and beat together till incorporated; "and divide into five-grain pills.—This pill may be also made without oil of peppermint, when so preferred," E). Mildly tonic and purgative, Dose, gr. v. to ʒi.—*Pilulæ Rhei et Ferri*, E. (Dried sulphate of iron, 4 parts; extract of rhubarb, 10 parts; conserve of red roses, 5 parts; beat them into a proper mass and divide it into five grain pills.) Tonic and laxative, useful in chlorosis; Dose, gr. x. to gr. xv.—*Infusum Rhei*, D. L. E. (Rhubarb, sliced (in coarse powder, E.), ʒi. (ʒiij. L. ℥i. E.); boiling (distilled, L.) water, *by measure* ℔ss. (Oi. L. f℥xviij. E.); macerate (digest, D.) for 2 hours in a vessel lightly covered (12 hours, and add f℥ij., of spirit of cinnamon, E.), and strain). Stomachic and very mildly laxative, a useful vehicle for more active purgatives, Dose, f℥i. to f℥iv.—*Tinctura Rhei*, E. (Rhubarb, in moderately fine powder, ℥iiiss.; cardamom seeds, bruised, ℥ss.; proof spirit, Oij.; mix the rhubarb and cardamoms, and proceed by the process of percolation as directed for tincture of cinchona; or it may be prepared by digestion). A cordial purgative, employed as an addition to cathartic mixtures in doses of f℥i. to f℥iij.—*Tinctura Rhei composita*, D. L. (Rhubarb, sliced, ℥ij. (℥iiss., L.); liquorice, bruised, ℥ss. (ʒvi., L.); saffron, ʒij. (ʒiij., L.); (cardamom seeds, freed from their capsules and bruised, ℥ss., D.; ginger, sliced, ʒiij., L.); proof spirit, *by measure* ℔ij. (Oij., L.); macerate for 7 (14, L.) days and filter). Uses and dose same as last preparation.—*Tinctura Rhei et Aloës*, E. (Rhubarb, in moderately fine powder, ℥iss.; Socotrine or East Indian aloes, in moderately fine powder, ʒvi.; cardamom-seeds, bruised, ʒv.; proof spirit, Oij.; mix the powders and proceed as for tincture of cinchona). A cordial purgative; Dose, f℥ss.

to f℥i.—*Vinum Rhei*, E. (Rhubarb, in coarse powder, ℥v.; canella, in coarse powder, 3ij.; proof spirit, f℥v.; sherry, Oi. f℥xv.; digest for 7 days, strain, express strongly, and filter). Stomachic and purgative; Dose, f3ij. to f℥i.—*Syrupus Rhei*, P. (Rhubarb, 90 parts; cold water, 500 parts; macerate for 12 hours, strain with expression, filter, and dissolve in the liquor twice its weight of sugar). Dose f℥ss. to f℥i.

Incompatibles.—*With the infusion*—Ammonia; carbonate of potash; lime water; the mineral acids; acetate of lead; tartar emetic; corrosive sublimate; the sesquisalts of iron; and astringent vegetable infusions or decoctions.

Ricini oleum, L. E. Ricinus communis, oleum e seminibus; D. *Castor oil; Oil expressed from the seeds of Ricinus communis.* The castor oil tree is a native of Africa and the East Indies; it is cultivated at present very extensively in the West Indies, and in North and South America; it also grows in the South of Europe and in the British Isles. It belongs to the Natural family *Euphorbiaceæ*, and to the Linnæan class and order *Monœcia Monadelphia*.

Botanical Characters.—In northern countries, a herbaceous annual seldom exceeding 3 or 4 feet in height, in warm climates it becomes an arborescent perennial, attaining a height of 20 to 30 feet; Leaves, large, of a dull green colour, shining, palmate, deeply cut into acute lobes, serrated; Flowers, in terminal panicles, glaucous-green, monœcious; Fruit a three-celled capsule covered with spines, each cell containing one seed; the seeds are oval, about three lines broad, four lines long, and a line and a half thick; the seed coat is pale grey, marbled with blackish and yellowish-brown spots and stripes; it encloses a thick, fleshy, oily nucleus, within which is a large, dicotyledonous leafy embryo.

Preparation.—The fixed oil of the seeds, which alone is officinal, is obtained by expression with or without the aid of heat, the seed coats being usually first removed; that obtained without heat, is called *cold drawn castor oil*, and bears the highest character. This is the process followed in the West Indies, and for the finer qualities of oil in the East; more generally, however, in the East Indies, the seeds are boiled in water, dried and bruised, and again boiled in water till the oil separates and floats on the surface. In North America, the seeds are heated and pressed, and the oil thus obtained is boiled with water to free it from impurities. The seeds yield about 30 per cent of oil.

Physical Properties.—Castor oil is a viscid oily liquid, of a very pale straw colour (inferior sorts are deep yellow), having a faint slightly nauseous odour, and a mild greasy taste. Sp. gr. 0·969.

Chemical Properties.—According to the analysis of Bussy and Lecanu, it is a compound of three fatty acids, *ricinic, elaïodic, and margaritic.* Its ultimate constituents according to Ure, are 74 per cent of carbon, 10·29 of hydrogen, and 15·71 of oxygen. Exposed to a cold a little below 32°, it becomes thick and turbid, at 0° it congeals into a transparent yellow mass; by exposure to the air it thickens and dries without becoming opaque, and hence is called a *drying oil;* it is decomposed by a heat above 500°. Castor oil is soluble in ether and in cold alcohol; the latter property is not possessed by any other fixed oil with which we are acquainted except concrete palm oil. East Indian castor

oil is the kind principally employed at present in the British Isles; West Indian castor oil is not imported; and American castor oil is but little esteemed by druggists, (although equally efficacious as a medicine and free from any unpleasant flavour), in consequence of its becoming turbid in cold weather and throwing down a copious deposit of white fatty crystals.

*Adulterations.*—The adulteration of castor oil with other fixed oils, a fraud more frequently practised in former days than at present, may be readily detected by its solubility in alcohol; pure castor oil being entirely dissolved by its own volume of alcohol. It should be also free from any rancid odour, or acrid taste.

Therapeutical Effects.—Castor oil is a mild but effectual cathartic, operating soon after it has been taken, without pain or uneasiness, producing three or four thin, feculent, not watery evacuations; these properties adapt it for all cases in which we desire to evacuate the contents of the intestinal canal, without producing abdominal irritation or general disturbance of the system. The only objection to its employment is its disagreeable greasy taste, in consequence of which it frequently occasions nausea and vomiting. The following are a few of the cases in which its use as a cathartic is particularly indicated; inflammatory or spasmodic diseases of the intestinal canal or of the urino-genital apparatus; hemorrhoidal affections; stricture of the rectum; during pregnancy and after delivery; in diseases of infancy and childhood; after surgical operations about the pelvis or abdomen, &c. If castor oil be at all rancid it becomes very acrimonious, causing much irritation, and sometimes even troublesome diarrhœa.

Dose and Mode of Administration.—f℥ss. to f℥ij., by the mouth or in the form of enema; it is best taken floating on the surface of water to which some aromatic tincture, as of cascarilla or of orange peel, has been added; or it may be made into an emulsion with yolk of egg or with mucilage. M. Parola has recently proposed the substitution of an ethereal or alcoholic tincture of castor-oil seeds for the oil itself. He states as the result of numerous trials he has made, that the tinctures are four times as strong as the oil, than which they are less irritant and less apt to produce vomiting. The tinctures (for which M. Parola does not give any formula) may be readily prepared by macerating ℥viij. of the seeds, freed from the seed-coats and bruised, in Oj. of rectified spirit or of ether for 7 days and filtering; the dose of either would be from f℥ij. to f℥iij.—*Castor oil purgative emulsion,* P. (Castor oil, f℥i.; yolk of egg, 1; mint water, f℥ss.; water, f℥ij.; simple syrup, f℥j.; mix). Sufficient for one dose.—*Castor-oil draught,* Righini. (Gum arabic, in fine powder, ℥ij.; pure water, f℥iij.; make a mucilage with a small quantity of the water; and add, of castor oil, f℥j.; mix carefully and pour in the rest of the water with constant agitation; and finally add the filtered juice of one orange and f℥j. of simple syrup). The nauseous taste of the oil is completely concealed in this draught, the only objection to which is its bulk.

Sambucus nigra, D. L. E. *The Common Elder.*—Elder flowers are officinal in the three pharmacopœias; the berries, and inner bark of the

stem are also officinal in the *Dublin Pharmacopœia*. It is a small, indigenous tree, belonging to the Natural family *Caprifoliaceæ*, and to the Linnæan class and order *Pentandria Digynia*. The inner bark possesses cathartic properties, but it is at present never employed. It was used by Sydenham and Boerrhave as a hydragogue in passive dropsies. It is given in decoction, prepared by boiling ʒj. of the bark in Oij. of water, down to Oj. The dose of this decoction is from fʒij. to fʒiv.

Scammonium, D. L. E. *Scammony; Gum-resin obtained from Convolvulus scammonia.* A native of Greece, and various parts of the Levant, where it is found growing in hedges and bushy places. It is placed in the Natural family *Convolvulaceæ*, and in the Linnæan class and order *Pentandria Monogynia*.

Botanical Characters.—Root, very thick, fusiform, fleshy, abounding in a milky juice; Stems, smooth, herbaceous, climbing; Leaves, pointed, hastate; Flowers, on long, solitary peduncles, yellowish, with purple stripes.

Preparation.—The inspissated juice of the root, which constitutes scammony, is procured as follows:—The earth having been cleared away, the top of the root is sliced off obliquely about two inches below where the stems spring from it; as the juice flows out it is received in shells and exposed to the air until it thickens; each root, although generally four feet in length, and three or four inches in diameter, yields only about two drachms of scammony.

Physical Properties.—Fine scammony, *Virgin scammony*, is in amorphous masses, weighing from two ounces to half a pound each, very porous, friable, and of an ash-grey colour externally; its fracture is conchoidal, very resinous, porous, and of a dark greenish-black colour; the odour is strong, peculiar, resembling somewhat that of old cheese, heightened by being breathed on, and the taste is acrid and nauseous; sp. gr. 1·210. This variety of scammony is scarce, and when met with bears a very high price. Scammony as it commonly occurs is an impure article, usually imported in boxes or drums, seldom in cakes; it is heavier than virgin scammony, more compact, and of a pale ash-grey colour; its fracture is earthy, dull, not porous, and of a greyish-black colour, in some specimens presenting numerous white specks (chalk); its odour and taste are the same as of pure scammony; sp. gr., from 1·276. to 1·543.

Chemical Properties.—According to Christison's analysis, fine specimens of virgin scammony consist of 81 to 83 per cent of resin, 6 to 8 per cent of gum, and some woody fibre, sand, moisture, and sometimes a trace of starch. In the best specimens which I have had an opportunity of examining, I have found but 76 per cent of resin. The resin is the active principle of the drug; it may be readily obtained by treating scammony with sulphuric ether and evaporating to dryness, or by the process of the *Ed. Ph.*, given below; in mass it is of a reddish-yellow colour, clear and semitransparent, its powder is pale straw colour, it is void of odour and taste when quite pure. It is soluble in alcohol, ether, and oil of turpentine, and forms with unskimmed milk a fine uniform emulsion. By the latter characteristic and also by its solubility in oil of turpentine it is distinguished from resin of jalap.

*Adulterations.*—No drug is more generally and more uniformly adulterated than scammony, it is indeed very difficult to meet with it in a perfectly pure state. And to so great an extent is the adulteration practised that in many specimens which I have examined I have frequently found not more than from 28 to 35 per cent of resin present. The substances used to adulterate the drug, are chalk and flour, either separately or conjointly, guaiacum resin and gum tragacanth. Chalk and flower may be readily detected; the former, by the effervescence produced when muriatic acid is dropped on a small fragment; the latter by a cooled and filtered decoction of the powder being rendered blue by tincture of iodine. The adulteration with guaiacum resin has been practised only within the last few years, but I have recently met with it in many samples. Its presence may be discovered by pouring a few drops of an alcoholic tincture of scammony on the fresh-cut surface of a raw potato, when if guaiacum be present a blue colour will be produced; or by exposing paper moistened with the tincture to nitrous acid fumes (obtained by pouring a little nitric acid over some slips of copper), which will be rendered blue if this fraud had been practised. I have never found tragacanth in scammony, but this sophistication is stated to have been recently detected in one instance. It may be discovered, by first separating the resin with sulphuric ether, and then treating the residue with cold water, when if any gum tragacanth be present a thick mucilage will be formed.

Therapeutical Effects.—Scammony, when pure, is a powerful cathartic, operating as a direct irritant to the intestinal mucous membrane, and producing copious watery evacuations. It is well adapted for cases of habitual constipation arising from a torpid state of the intestinal canal, in passive dropsies, in apoplectic affections, and as an active purgative for children, for whom it is beneficially combined with calomel. If there be any tendency to inflammation of the digestive organs, scammony is contraindicated as a cathartic. From the difficulty of procuring the drug in a pure state, scammony has of late years fallen into much disrepute.

Dose and Mode of Administration.—In powder, if the scammony be pure, for an adult, gr. viij. to gr. x., but as usually met with, double that quantity; it should be prescribed in combination with some bland powder, or made into an emulsion with milk.—*Pulvis Scammonii compositus*, D. L. (Scammony; hard extract of jalap, of each, ℥ij.; ginger, ℥ss.; rub separately to very fine powder, and mix). Dose, for an adult, gr. x. to gr. xx.; for a child, gr. iij. to gr. v.—*Extractum sive Resina Scammonii*, E. (Take any convenient quantity of scammony in fine powder, boil it in successive portions of proof spirit till the spirit ceases to dissolve anything, filter, distil the liquid till little but water passes over, then pour away the watery solution from the resin at the bottom, agitate the resin with successive portions of boiling water till it is well washed, and lastly, dry it at a temperature not above 240°). Dose, gr. ij. to gr. v.; best administered according to the following formula.—*Mistura Scammonii*, E. (Resin of scammony, gr. vij.; unskimmed milk, f℥iij.; triturate the resin with a little of the milk, and gradually with the rest of it till a uniform emulsion be obtained). In-

tended for one dose for an adult, but much too powerful; I have always found gr. v., triturated with the same quantity of milk sufficient for the most obstinate bowels. This mixture cannot be distinguished either by smell or taste from rich new milk, and consequently forms a very convenient purgative for children in doses of f℥ss. to f℥iss.—*Electuarium (Confectio,* L.*) Scammonii,* D. L. (Scammony, powdered, ℥iss.; cloves, bruised; ginger, powdered, of each, ʒvj.; oil of caraway, f3ss.; syrup of roses, q. s.; "pour the syrup on the powders, then having added the oil of caraway, mix all thoroughly," D. "Rub the dry ingredients together to very fine powder, and preserve them; then, whenever the confection is to be used, the syrup being gradually poured in, rub again; lastly, the oil of caraway being added, mix them all," L.) A stimulating cathartic, but seldom used; Dose, for an adult, ʒss. to ʒi.; for children, gr. v. to gr. xij.—*Scammony biscuits,* (Scammony resin, in fine powder, ʒi.; castile soap, gr. v.; white sugar, ℈ij.; reduce to a fine powder and mix intimately with ℥i. of powdered biscuit; make into a stiff paste with a few drops of water; divide into portions of ʒi. each and dry in the air.) Each drachm contains gr. vi. of scammony resin.

Incompatibles.—All acids.

Senna, D. L. *Leaves of Cassia Senna,* D.—*Of Cassia lanceolata and Cassia obovata,* L.—*Senna Leaves.*

Senna Alexandrina, E. *Leaves of various species of Cassia, probably of Cassia lanceolata, of C. acutifolia, and of C. obovata; Alexandrian senna. As imported it also contains an abundant admixture of leaves of Cynanchum Argel, which ought to be removed as far as possible by picking.*

Senna Indica, E. *Leaves of Cassia elongata; East Indian Senna, var, Tinnivelly.*

Some confusion still exists as to the species of the genus cassia which yield the senna leaves of commerce. The *Dublin College,* in referring them to one species, has perpetuated the error of Linnæus who confounded several together; upon the whole the references of the *Edinburgh College* appear to be the most correct. The various species are inhabitants of the North of Africa particularly Egypt, of Arabia, and of the Indian peninsula, where probably it has been introduced, and is now naturalized; they are also cultivated in the South of Europe, and in some of the West Indian Islands. The genus belongs to the Natural family *Leguminosæ (Fabaceæ,* Lindley), and to the Linnæan class and order *Decandria Monogynia.*

Botanical Characters.—Shrubs or herbs, frequently annual; Leaves, simply and abruptly pinnate; petioles, frequently glanduliferous; Leaflets opposite; Sepals, five, more or less unequal; Petals, five, unequal; Stamens, ten, free, unequal; Ovary, stalked, frequently arched; Legumes, various.

Preparation.—Senna leaves are gathered by the Arab tribes in Ethiopia, Arabia Felix, Abyssinia, Nubia and Sennaar, where the shrub is chiefly indigenous. The harvest begins about the end of September; the branches are cut off the trees and exposed to the sun until the leaves begin to fade, when they are placed on high ground and on rocks, so as to be dried as quickly as possible.

When quite dry, the branches are laid in heaps and beaten with sticks until the leaves fall off. No account of the method followed in India for the preparation of Senna has been yet published; but it is probably similar to that used in Egypt.

Physical Properties.—Three sorts of senna are commonly known in the English Market, Alexandrian senna, Tripoli senna, and East Indian senna. 1st.—Alexandrian senna, the produce of Nubia and Upper Egypt, is imported in large bales and barrels from Alexandria; it consists of greyish-green leaflets usually much broken, mixed with the flowers and fruits of the various species from which it is obtained; there is also a large quantity, generally about a tenth of the weight, of the leaves, flowers, and fruit of the *Cynanchum Argel;* and sometimes a considerable number of pods, with a few leaves of the *Tephrosia apollinea.* The odour of Alexandrian senna is nauseous, but resembles in some respects that of tea; the taste is viscid and nauseous. 2nd.—Tripoli senna; It scarcely differs from that just described, for which it is indiscriminately sold; the leaflets are perhaps more broken down, smaller and of a greener colour, it seldom contains either Cynanchum or Tephrosia leaflets. 3rd.—East Indian Senna, *Tinnivelly senna;* this occurs in large unbroken leaflets, from one to two inches long, and half an inch broad, thin and flexible, and of a fine green colour; many of the leaflets, however, are blackish probably from imperfect drying; both odour and taste are similar to, but a little weaker than Alexandrian senna.

Chemical Properties.—According to M. M. Lassaigne and Feneulle, Alexandrian senna is composed of *cathartin,* chlorophylle, yellow colouring matter, mucus, albumen, malic acid, and some salts. *Cathartin,* supposed to be the purgative principle, is an uncrystallizable, deliquescent substance with a peculiar odour, and a bitter, nauseous taste; it is soluble in water and in alcohol, but insoluble in ether. Senna leaves yield their active properties to both cold and warm water, to proof spirit and to alcohol; warm water extracts about a third of the weight of the leaves.

*Adulterations.*—In Egyptian senna, as met with in British commerce, the only adulteration that is practised, has been before indicated, namely with Argel, and sometimes with Tephrosia leaflets. The former are readily distinguished by their paler yellowish colour, their coriaceous texture, their under surface being reticulated with veins, their upper surface somewhat rugose, and by their being equal-sided; the leaflets of all the true sennas being unequal at the base. Tephrosia leaflets are easily known by their silky surface, and by the lateral veins proceeding parallel to each other to the very edge of the leaf without ramifying. Two other adulterations are common on the continent, but have been never met with, as far as I am aware, in the British market; one is with the leaflets of the *Colutea arborescens* or bladder senna, which may be at once distinguished by their regularity at the base; the other, a more serious fraud, in consequence of the poisonous property of the substance employed, is with the leaflets of the *Coriaria Myrtifolia;* they are known by presenting three very prominent longitudinal nerves, and chemically by their infusion producing with solution of sulphate of iron, a blackish precipitate *(tannate of iron),* and with gelatin a heavy whitish precipi-

tate, *(tannate of gelatin)*. Senna adulterated with the leaves of the *Vaccinium vitis-idæa*, containing so much as 75 per cent of them, has recently occurred in the French market; the fraud is one easily detected by the character of the leaves, particularly by the reticulated surface of the latter.

Therapeutical Effects.—Senna is an active cathartic, holding a middle place between the milder and more active medicines of this class; operating effectually, yet safely, though often producing nausea, griping and flatulence; its action is somewhat stimulating, increasing the secretions, and exciting the peristaltic action chiefly, but not alone, of the small intestines. It is adapted for all cases requiring an effectual purgative; but it should be combined with the active saline cathartics—for which the infusion is a good vehicle, if it be wished to diminish arterial action or to produce general antiphlogistic effects. The only circumstance contra-indicating its employment is an inflammatory condition of the mucous membrane of the alimentary canal. The cathartic principle of senna is absorbed before its operation is produced, as is proved by its action on the intestines when the infusion is injected into the veins, and also by its imparting a purgative property to the milk of nurses.

Dose and Mode of Administration.—Senna is not administered in the form of powder; ʒij. to ʒss. infused in fʒij. of boiling water for half an hour and the clear infusion poured off, will be sufficient for a dose; its taste is much concealed by the addition of some black tea, and it may be sweetened with sugar, and milk added; in this way it is readily taken by children.—*Infusum Sennæ compositum*, D. L. *Infusum Sennæ*, E. (Senna, ʒj. (ʒxv. L. ʒiss. E.); ginger, sliced, ʒiss. (ϑiv. L. E.); boiling (distilled, L.) water, *by measure* ℔j. (Oj. L. E.); macerate for an hour in a close vessel and strain "through linen or calico;" E.). Dose, fʒij. to fʒiv. The common cathartic mixture, *Black Draught*, of hospitals, is prepared by adding ʒj. of sulphate of magnesia to fʒiv. of this infusion.—*Infusum Sennæ cum Tamarindis*, D. *Infusum Sennæ compositum*, E. (Senna, ʒi.; tamarinds, ʒi.; coriander seeds, bruised, ʒi.; brown sugar, ʒss.; boiling water, fʒviij.; digest in a close earthen vessel, not glazed inside with lead, for four hours and strain; it may be made with twice (or thrice, E.) the quantity of senna). An excellent cathartic infusion; Dose, fʒij. to fʒiv.—*Syrupus Sennæ*, L. (Senna, ʒiiss.; fennel, bruised, ʒx.; manna, ʒiij.; sugar, ʒxv.; boiling water, Oi.; macerate the senna and fennel in the water, with a gentle heat, for an hour; strain; add the manna and sugar, and boil down to a proper consistence).—E. (Senna, ʒiv.; boiling water, fʒxxiv.; treacle, ʒxlviij; infuse the senna in the water for twelve hours, strain and express strongly; concentrate the treacle in a vapour bath as far as possible, or till a little taken out on a rod becomes nearly concrete on cooling, and while the treacle is still hot add the infusion, stirring carefully, and removing the vessel from the vapour-bath as soon as the mixture is complete. If Alexandrian senna be used for this preparation, it must be carefully freed of Cynanchum leaves). An agreeable cathartic for children, in doses of from fʒi. to fʒiv, or as an addition to cathartic mixtures for adults, in doses of fʒss. to fʒj.—*Potio cathartica* P. (Senna, ʒi.; rhubarb, ʒss.;

sulphate of soda, ʒij.; manna, ʒi.; infuse the senna and rhubarb for half an hour in fʒij. of water, with a gentle heat; filter and add the salt and the manna, and when they are dissolved, strain with expression). An excellent cathartic draught.—*Electuarium Sennæ*, D. (Senna, in fine powder, ʒiv.; pulp of prunes, ℔j.; pulp of tamarinds, ʒij.; syrup of brown sugar, *by measure* ℔iss.; oil of caraway, ʒij.; boil the pulps in the syrup to the consistence of honey, then add the powder, and when the mixture has cooled, the oil; mix all well together).—*Electuarium Sennæ*, E. *Confectio Sennæ*, L. (Senna, ʒviij.; figs, ℔i.; (tamarind pulp, and cassia pulp, of each, ℔ss. L.); prunes, ℔ss. (℔j. E.); coriander, ʒiv.; liquorice-root, (bruised, E.), ʒiij.; sugar, ℔iiss; water, Oiij.; powder together the senna and the coriander, and sift out ʒx.; boil the figs and the liquorice (the residue E.) in the water to half; squeeze and strain; evaporate in a water-bath down to fʒxxiv.; form a syrup by adding the sugar; add the syrup to the prunes (and other pulps, L.), throw in the sifted powder, and mix all). Commonly known as *lenitive electuary*, a mild but efficacious compound in doses of ʒij. to ʒss.; generally badly prepared, and very liable to adulteration, the true preparation being both troublesome and expensive.—*Electuarium Sennæ*, F. (Senna, in fine powder, ʒviij.; pulp of tamarinds, ʒxxiv.; coriander, in powder, ʒi.; syrup, fʒxvi.; mix). Dose, ʒij. to ʒss.—*Tinctura Sennæ composita*, D. L. (Senna leaves, ℔j. (ʒiiiss. L.); caraway, bruised, ʒiss. (ʒiiiss. L.); cardamom seeds, bruised (and deprived of their capsules, D.), ʒss. (ʒi. L.); (raisins, ʒv. L.); proof spirit, cong. j. (Oij. L).; macerate for 14 days and strain).—E. (Sugar, ʒiiss.; coriander, bruised, ʒi.; jalap, in moderately fine powder, ʒvi.; caraway, bruised; and cardamom seeds, bruised, of each, ʒv.; raisins, bruised; and senna, of each, ʒiv.; proof spirit, Oij.; digest for seven days, strain, express and filter; may be more conveniently and expeditiously made by percolation as directed for compound tincture of cardamoms; if Alexandrian senna be used it must be freed from Cynanchum leaves by picking). A stimulating and cordial cathartic, in doses of fʒss. to fʒj., only fit for cold leucophlegmatic habits; more generally prescribed as an adjunct to infusion of senna, or other cathartic mixtures, in doses of fʒi. or fʒij. to correct their griping qualities.—*Fluid extract of Senna*, Duncan. (Tinnivelly senna, ℔xv.; exhaust with boiling water by displacement—about four times its weight of water is sufficient; concentrate the infusion *in vacuo* to ℔x.; dissolve in the product ℔vi. of treacle previously concentrated over the vapour-bath, till a little of it becomes nearly dry on cooling; add of rectified spirit, fʒxxiv. (Dens. ·835.), and if necessary add water (ʒxvj.) to make Oxv.). Every fluid ounce of this extract corresponds to one *avoirdupois* ounce of senna: the dose is fʒij. for an adult. This is an excellent preparation, operating effectually, and seldom causing griping or any other annoyance. Alexandrian senna may be used instead of Tinnivelley, the Cynanchum leaves having been previously removed by picking.

Incompatibles.—The mineral acids; lime water; acetate of lead; tartar emetic; corrosive sublimate; and nitrate of silver.

Sodæ hyposulphis.—*Hyposulphite of soda; Sulphuretted sulphite of soda.*

Preparation.—Take of carbonate of soda, dried and powdered, 500 parts; sublimed sulphur, 100 parts; mix, and heat in a glass or porcelain capsule until the mass is completely fused, stirring constantly so as to expose every part of it to the contact of the air. When cold, dissolve in water, filter, and having added more sulphur, boil for a few moments. Filter again and evaporate with a gentle heat so as to obtain crystals. Walchner.

Physical Properties.—Hyposulphite of soda occurs in beautiful, four-sided prismatic crystals, transparent, inodorous, with a bitter, saline taste.

Chemical Properties.—It is composed of one eq. of soda, one of hyposulphurous acid, and ten of water, (Na O, $S^2$ $O^2$ + 10 HO.) It is soluble in water. Sulphuric acid added to a solution of hyposulphite of soda, disengages sulphurous acid gas and precipitates sulphur.

Therapeutical Effects.—This salt produces effects very nearly similar to those of sulphate of soda, acting as an active cathartic when given in a sufficient dose. In France it is generally preferred to the other neutral salts as a purgative in cutaneous affections.

Dose and Mode of Administration.—From ʒvi. to ʒi. dissolved in water, to which some aromatic tincture is added.

Incompatibles.—The mineral acids, and most salts.

Sodæ phosphas, D. L. E. *Phosphate of Soda.*

Preparation.—Phosphate of soda is an article of the Materia Medica in the London Pharmacopœia; the processes of the Dublin and Edinburgh Colleges are as follows:—"Take of bone ashes, in powder, ten parts (℔x., E.); sulphuric acid, seven parts (Oij. fʒiv., E.); mix the powder in an earthen vessel with the acid, and add gradually seven parts (Ovj., E.) of water; agitate; digest for 3 days, adding water that the materials may not become dry, (and agitate continually, D.); then add seven parts (Ovj., E.) of boiling water, and strain through linen, washing with warm water so as to remove all the acid; let the impurities subside, and evaporate the clear liquor to one half (to Ovj., E.); (let the impurities again settle, and to the clear liquor poured off and heated to ebullition, E.) then add eight parts (sufficient to neutralize the acid, E.) of carbonate of soda previously dissolved in boiling water; strain, and by alternate evaporation and cooling obtain crystals which are to be kept in a close vessel, (which, if requisite may be purified by recrystallization, D.). (More crystals will be obtained by successively evaporating, adding a little carbonate of soda till the liquid exerts a feeble alkaline reaction on litmus paper, and then allowing it to cool, E.)."

Physical Properties.—Transparent, colourless crystals, the form of which is the oblique rhombic prism; inodorous, with a cooling, saline, not unpleasant taste. Sp. gr. 1·333.

Chemical Properties.—It is composed of 2 eq. of soda, 1 of phosphoric acid, 1 of basic water, and 24 of water of crystallization, (HO, 2 Na O, $PO^5$ + 24 HO); it effloresces and becomes opaque by exposure to the air; moderately heated it fuses in its water of crystallization, which if the heat be increased is driven off. Phosphate of soda dissolves in four times its weight of cold water, and in twice its weight of boiling water; the solution has a feeble alkaline reaction; it is nearly insoluble in alcohol.

*Adulterations.*—This salt is in general tolerably pure; if the precipitate occasioned in a solution by muriate of baryta be not entirely dissolved by nitric acid, a sulphate is present; and if that caused by nitrate of silver be not dissolved by nitric acid, a muriate is present.

Therapeutical Effects.—A mild saline cathartic, resembling in its operation the sulphates of magnesia and soda, to either of which it should be preferred for children and delicate persons, in consequence of the mildness of its taste. It is particularly adapted as a cathartic for individuals affected with deposits of uric acid in the urine, as it possesses a remarkably solvent action on that acid.

Dose and Mode of Administration.—℥iv. to ℥xij.; it may be given dissolved in water or in any of the cathartic vegetable infusions; or it is readily taken by children dissolved in broth or soup, to which it imparts only a saline taste.

Incompatibles.—The mineral acids; lime water; magnesia; chloride of barium; nitrate of silver, and the acetates of lead.

## Sodæ et Potassæ tartras, D. E. Sodæ Potassio-tartras, L.

*Tartrate of Soda and Potash; Rochelle salt.*

Preparation.—D. L. E.—"Carbonate of soda, five parts (℥xij., L. E.); bitartrate of potash, in fine powder, seven parts (℥xvj., L. E.); boiling water, fifty parts (Oiv., L. E.); to the carbonate of soda dissolved in the water, add by degrees (to neutralization, E.) the bitartrate of potash; evaporate the filtered liquor (till a pellicle forms on its surface, L. E.), and set it aside, that as it cools crystals may be formed. (Evaporate the liquor again that it may yield crystals, L. E.)."

Physical Properties.—This salt occurs in large, beautiful, transparent crystals, which are right rhombic prisms, generally produced in halves; inodorous, with a saline, somewhat bitter taste. Sp. gr. 1·757.

Chemical Properties.—It is composed of 1 eq. of soda, 1 of potassa, 2 of tartaric acid, and 10 of water, (KO, Na O, 2 ($C^8H^4O^{10}$) + 10 HO). In very dry air it effloresces slightly; exposed to a moderate heat it fuses in its water of crystallization; by a strong heat it is decomposed, and converted into a mixture of charcoal and the carbonates of soda and potash. It dissolves in five parts of cold, and one of boiling water.

As this salt is generally sold in crystals, it is not liable to adulteration.

Therapeutical Effects.—A mild cooling laxative, not so active as most of the other saline cathartics, than which also its taste is less disagreeable; it is seldom prescribed alone, but is in very general use as the active ingredient in the commonly called Seidlitz *(Seignettes?)* powders.

Dose and Mode of Administration.—℥ij. to ℥vj. or ℥i. dissolved in a large quantity of water. *Seidlitz powders* consist of ℥ij. of tartrate of soda and potash, and ℈ij. of bicarbonate of soda, reduced to powder and mixed, contained in a blue paper, and ℥ss of powdered tartaric acid in a white paper; they are taken, dissolved in from half a pint to a pint of water, while the liquid is in a state of effervescence. They form an agreeable and mild aperient.

Incompatibles.—Most acids and acidulous salts; lime water; the salts of lime; and the acetates of lead.

### Sodæ sulphas, D. L. E. *Sulphate of Soda. Glauber's salts.*

Preparation.—*Dub.*—"Dissolve the salt which remains after the distillation of muriatic acid in a sufficiency of boiling water; set aside the filtered liquor after due evaporation, that as it cools crystals may form." *Lond.*—"Take of the salt which remains after the distillation of hydrochloric acid, ℔ij.; boiling water, Oij.; carbonate of soda, a sufficiency; dissolve the salt in the water, then add gradually sufficient carbonate of soda to neutralize the acid; boil down till a pellicle appears, and set aside the strained solution that crystals may be formed; pour off the liquor and dry them." *Edin.*—"Take of the salt which remains after making pure muriatic acid, ℔ij.; boiling water, Oiij.; white marble, in powder, a sufficiency; dissolve the salt in the water, add the marble so long as effervescence takes place, boil the liquid, and when neutral, filter it; wash the insoluble matter with boiling water, adding the water to the original liquid; concentrate till a pellicle begins to form, and then let the liquid cool and crystallize."

Physical Properties.—A solid, white salt, crystallized either in small acicular crystals, or in long prisms the sides of which are often channeled; inodorous; with a cooling, saline, very bitter taste. Sp. gr. 2·246.

Chemical Properties.—It is composed of 1 eq. of soda, 1 of acid, and 10 of water, (Na O, $SO^3$ + 10 HO). By exposure to the air it effloresces rapidly, loses all its water of crystallization, and a white powder is left. Heated it fuses, but at the temperature of 210° it becomes a white solid, which is again liquefied at a red heat, but is not decomposed. Sulphate of soda is soluble in three parts of water at 60°, and in all proportions in boiling water. It is insoluble in alcohol.

Therapeutical Effects.—An active saline cathartic, increasing remarkably the intestinal secretions; in its mode of operation it resembles sulphate of magnesia, and may be used in the same cases; in consequence, however, of its more disagreeable taste and its tendency in some habits to produce griping, it is not so frequently employed as that salt.

Dose and Mode of Administration.—3v. to 3x. dissolved in from two to four ounces of water; ten or twelve drops of dilute sulphuric acid added to the solution, conceal to a great extent its disagreeable taste. The effloresced salt is about twice as active as the crystals.

Incompatibles.—Carbonate and bicarbonate of potash; the salts of lime, and of baryta; the acetate and diacetate of lead; acetate of potash; and nitrate of silver, if the solution be strong.

### Sulphur sublimatum, D. L. Sulphur, E. *Sublimed Sulphur. Sulphur or Brimstone.*

An elementary substance found in large quantities in an impure state, in the neighbourhood of volcanoes; it is also found combined with metals in many parts of the earth; and with hydro-

gen in many mineral waters. Crude sulphur is imported into Britain from Italy and Sicily.

Preparation.—Sublimed sulphur is an article of the Materia Medica in the Dublin and London Pharmacopœias; in the Edinburgh it is directed to be prepared "by subliming sulphur in a proper vessel, washing the powder thus obtained with boiling water in successive portions till the water ceases to have an acid taste, then drying the sulphur with a gentle heat."

Physical Properties.—Two kinds of sulphur are commonly met with, Roll-sulphur or Brimstone, and Flowers of sulphur or Sublimed sulphur. *Roll-sulphur* is in cylindrical pieces from two to three inches long, and nearly an inch in diameter, obscurely crystallized in the centre, crackling when held in the warm hand, very friable, and breaking with a shining crystalline fracture. *Sublimed sulphur* is in the form of fine powder, which when examined by the microscope, is seen to be composed of crystalline grains; both kinds are of a bright, yellowish-green colour, with an almost imperceptible taste, and a faint peculiar odour when rubbed. Sp. gr. 1·98. Atomic weight, 16·119.

Chemical Properties.—Sulphur is a simple substance, insoluble in water and in alcohol. It fuses at 226°, and between that temperature and 280°, it forms a clear liquor of an amber colour; at 320° it thickens, assumes a reddish tint, and if the heat be continued, becomes a thick tenacious mass; from 482° to its boiling point 601°, it becomes again more fluid, and finally rises in vapour before it is completely fused. Sulphur, if ignited, burns with a lambent blue flame, and is converted into sulphurous acid gas.

*Adulterations.*—Flowers of sulphur seldom contain any impurities; those of a fixed nature may be detected by subliming; if any adhering sulphuric acid be present, distilled water agitated with the sulphur reddens litmus paper. Roll-sulphur usually contains a large quantity of orpiment *(sesquisulphuret of arsenicum)*, and therefore should not be used in medicine.

Therapeutical Effects.—In large doses, sulphur acts as a mild cathartic, producing its effects by stimulating the muscular coat of the intestines, the evacuations caused by it being usually solid. In consequence of the mildness, but certainty of its operation, it is generally employed in hemorrhoidal diseases, and in stricture or other painful affections of the rectum. From being converted into sulphuretted hydrogen in the intestines, the evacuations and the insensible perspiration of the individual, during and for some time after its operation, are insupportably fetid.

Dose and Mode of Administration.—As a cathartic, ʒiij. to ʒiv. made into an electuary with honey or treacle; it is usually given in combination with jalap and bitartrate of potash.—*Sulphur lotum*, D. "the sublimed sulphur of the shops washed with hot water to free it from any adhering acid, as indicated by litmus paper; and then dried on bibulous paper."—*Sulphur præcipitatum*, vel *Lac Sulphuris, (Precipitated Sulphur; milk of Sulphur)*. This preparation, which was at one time very generally employed instead of sublimed sulphur, has nearly fallen

into disuse, in consequence of the very impure state in which it is usually sold. It is prepared by boiling one part of sublimed sulphur and two parts of slaked lime in eight parts of water; filtering the solution and adding sufficient muriatic acid to precipitate all the sulphur, which is then dried on a stove. The dose is the same as that of sublimed sulphur, than which it was supposed to have a milder taste and smell. The most ordinary adulteration of this preparation is with sulphate of lime, of which it frequently contains from 40 to 50 per cent. Its presence may be readily detected by heating any quantity of the preparation on a metallic plate, when the whole of the sulphur will be sublimed and any sulphate of lime it may contain will be left behind.

Tamarindus, D. L. E. *Tamarinds; Pulp of the legumes of Tamarindus Indica.* A native of the East Indies, from whence it has been carried into Africa, where it now grows plentifully in Upper Egypt, it is also cultivated in the West Indian Islands, and in South America. It belongs to the Natural family *Leguminosæ (Fabaceæ,* Lindley), and to the Linnæan class and order *Diadelphia Triandria.*

Botanical Characters.—A beautiful tree, about thirty feet in height, branching superiorly; Leaves, abruptly pinnate, alternate; Flowers, in terminal, pendant racemes, of a lemon-yellow colour. Fruit, a legume, stalked, from three to four inches long, and nearly an inch broad, slightly compressed, 3-12 seeded; it is composed of a dry, brittle, brown shell, filled with a reddish acidulous pulp, in which are imbedded the smooth, quadrangular seeds.

Preparation.—The pulp of the fruit is freed from the husk, and with the contained seeds is packed in layers in barrels, and boiling syrup poured over it; the drier and dark-coloured East Indian tamarinds are said to be preserved without sugar, *(Pereira.)*

Physical Properties.—Tamarinds, as imported, are of a reddish-yellow colour *(West Indian),* or reddish-brown *(East Indian),* of the consistence of candied-honey, being composed of the pulp, the seeds, and numerous vegetable fibres; they have a slightly vinous odour, and a sweet very acid taste, somewhat astringent.

Chemical Properties.—Tamarind pulp is composed of citric, tartaric, and malic acids, bitartrate of potash, sugar, vegetable jelly, and parenchyma. It yields its properties to water, affording an acid solution.

*Adulterations.*—Tamarinds as imported, frequently contain an appreciable quantity of copper; sulphuric acid is also sometimes added to tamarinds which have not been well preserved or have been too long kept, to give them an acid taste. The contamination with copper may be detected by plunging a plate of polished iron, as a knife, into the tamarinds, when should any copper be present, the iron will receive a coating of that metal. Sulphuric acid may be detected by a strained decoction giving a white precipitate, insoluble in nitric acid, with solution of muriate or nitrate of baryta. In the French market tamarinds are often met with which contain large quantities of animal charcoal, its presence may be readily detected by agitating the fruit with cold water.

Therapeutical Effects.—Tamarind pulp is refrigerant and mildly laxative, but although adapted for mild febrile or inflammatory affections occurring in children, it is seldom employed alone. Its combinations with senna have been before mentioned.

Dose and Mode of Administration.—ʒss. to ʒiss.—Tamarind whey is prepared by boiling ʒi. of tamarinds with Oj. of new milk, and straining; it is an excellent cooling, gently laxative drink in febrile diseases.

Incompatibles.—The salts of potash; alkaline carbonates; lime water; tartar emetic; and the acetates of lead.

Terebinthinæ oleum. *Oil of turpentine* (described in the division *Anthelmintics)* given in large doses acts as an active cathartic; when administered alone, however, its action is uncertain, and consequently it is usually prescribed in combination with castor oil; in this form it proves a most effectual purgative in obstinate constipation, especially when dependant on affections of the brain; in spasmodic diseases, as in chorea, hysteria, epilepsy, and tetanus; in sciatica and other neuralgic affections; in passive hemorrhages; and in purpura hæmorrhagica; in the latter disease administered in large doses it has proved very successful in my hands, (See *Dublin Journal of Medical Science*, Vol. xxviii. p. 189.) The dose of oil of turpentine, as a cathartic, is from fʒij. to fʒij., either given by the mouth or in the form of enema. (See *Anthelmintics.)*

Viola, E. Viola odorata, flores, D.—*Flowers of Viola odorata.* An indigenous plant; belonging to the Natural family *Violaceæ*, and to the Linnæan class and order *Pentandria Monogynia.*

Botanical Characters—An humble, perennial creeper; Leaves very numerous, cordate, nearly glabrous; Runners, flagelliform; Flowers, appearing in March and April, blue (after expansion turning deep purple), often white.

Preparation.—The Flowers are gathered as soon as they expand, and dried with a stove heat between folds of bibulous paper; their properties are best preserved in the form of the syrup of violets of the pharmacopœias.

Physical Properties.—"Violet flowers are so remarkable for their odour and colour, that they have given a name to both" *(Duncan).*

Chemical Properties.—They are composed of odorous principle, blue colouring matter, sugar, gum, albumen, and some salts. Violets yield their active principles to water, but not to alcohol. The infusion is a delicate test for both acids and alkalies, and as such is much employed by chemists.

Therapeutical Effects.—Violet flowers possess mildly laxative properties, and in the form of syrup are sometimes administered to new-born infants, and to young children.

Dose and Mode of Administration.—*Syrupus Violæ*, D. (Fresh petals of the violet, ℔ij.; boiling water, *by measure* ℔v.; macerate for 24 hours, then strain through fine linen without expression, and add

sugar so as to make a syrup).—E. (Fresh violets, ℔j.; boiling water, Oiss.; pure sugar, ℔viiss.; infuse the flowers for 24 hours in a covered glass or earthen-ware vessel; strain without squeezing, and dissolve the sugar in the filtered liquor). Dose, f℥i. to f℥iv.—*Mel Violæ.* (Fresh violet flowers, one part; honey, five parts). A mild laxative readily taken by children; Dose, ℥i. to ℥ss.

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# CHAPTER VI.

## CAUSTICS.

(Escharotics.—Cauterants.—Catheretics).

Caustics are substances which, applied to the human body, disorganise and destroy the parts with which they come in contact. Their action is chemical, as they destroy the life of the part, either by combining with the animal matter so as to form a new compound with it, or by causing the elements of the animal tissues to enter into new combinations, by which their cohesion is subverted and their composition changed. The effects produced by caustics are more or less rapid according to the energy of the substance that is used; if it be very powerful the change of structure effected is so immediate, that surrounding inflammation takes place only after the death of the part; but on the contrary, inflammation is the direct consequence of the less energetic caustics. The action of this class of remedies is generally local, but some of them (as arsenious acid) may become absorbed, and thus produce constitutional symptoms. The various purposes for which caustics are employed, will be treated of when considering the individual remedies of the class.

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### Acidum aceticum, D. L. E.—*Acetic acid.*

Preparation.—*Dub.*—"Acetate of potash, 100 parts; sulphuric acid, 52 parts; to the acid poured into a tubulated retort, add gradually the acetate of potash, waiting after each addition until the mixture cools; then with a moderate heat distil the acid to dryness." *Lond.*—"Acetate of soda, ℔ij.; sulphuric acid, ℥ix.; water, f℥ix.; add the sulphuric acid, first mixed with the water, to the acetate of soda put into a glass retort, then let the acid distil from a sand

bath; care is to be taken that the heat be not too great towards the end." *Edin* —"Take of acetate of lead any convenient quantity, heat it gradually in a porcelain basin by means of a bath of oil or fusible metal (8 tin, 4 lead, 3 bismuth), to 320° F; and stir till the fused mass concretes again; pulverise this when cold, and heat the powder again to 320°, with frequent stirring, till the particles cease to accrete, add ℥vi. of the powder, to f℥ixss. of pure sulphuric acid contained in a glass mattrass; attach a proper tube and refrigeratory, and distil from a fusible metal bath with a heat of 320°, to complete dryness. Agitate the distilled liquid with a few grains of red oxide of lead to remove a little sulphurous acid, allow the vessel to rest for a few minutes, pour off the clear liquid and redistil it."

Physical Properties.—A limpid colourless liquid, with a very pungent refreshing smell, and a caustic, highly acrid taste. The specific gravity differs in the three British pharmacopœias; that of Edinburgh, which is the strongest, is 1·063 to 1·065, but not above 1·068·5; that of London 1·048; and that of Dublin 1·074.

Chemical Properties.—Acetic acid *(Edin.), Glacial acetic acid,* consists of one eq. of anhydrous acetic acid ($C^4$ $H^3$ $O^3$), and one of water; it crystallizes at 60°, and is vaporizable at 248° F.; when of the density 1·063, one hundred mimims (97 grains), neutralize nearly 242 grains of crystallized carbonate of soda. Acetic acid *(Dub.)* consists of one eq. of anhydrous acetic acid, and three of water; 100 grains neutralize nearly 184 grains of carbonate of soda. Acetic acid *(Lond.)* consists of one eq. of anhydrous acid, and thirteen of water; 100 grains neutralize 87 grains of crystallized carbonate of soda. Acetic acid reddens litmus paper, and its vapour fumes with ammonia; it combines with many of the metallic oxides forming crystallizable salts; it dissolves the vegetable alkaloids, camphor, resins, fibrine, albumen, and also the active principles of many vegetable medicines, in consequence of which properties it is much employed in pharmacy.

*Adulterations.*—It should be of the prescribed density, if lighter it probably does not contain sufficient of the anhydrous acid, but as before remarked with respect to vinegar, this test cannot be depended on; the strength can be more accurately ascertained by its neutralizing power over carbonate of soda. It is sometimes adulterated with sulphuric or muriatic acid; the former may be detected by the production of a white precipitate insoluble in nitric acid on the addition of solution of muriate or nitrate of baryta; the latter by a similar precipitate being produced on the addition of solution of nitrate of silver. The occasional impregnation with lead or copper is readily detected by sulphuretted hydrogen causing a black precipitate.

Therapeutical Effects.—Acetic acid undiluted has been used, it is stated with much success, as a local application in the advanced stages of porrigo, impetigo, or eczema of the scalp; a piece of lint rolled round a stick is moistened with the acid and applied to the diseased surface for a few seconds, the pain caused is very acute but temporary; one or two applications are said to be usually sufficient to effect a cure. It is also employed as a caustic to destroy corns and warts, the latter especially, when of a syphilitic origin.

ACIDUM MURIATICUM, D. E. ACIDUM HYDROCHLORICUM, L.—*Muriatic acid; Hydrochloric acid.*

PREPARATION.—*Dub.*—"Dried muriate of soda, 100 parts; commercial sulphuric acid, 87 parts; water, 124 parts; mix the acid with half the water, and when cold pour it on the muriate of soda in a glass retort, put the rest of the water into the receiver, annex the retort so that the gas may be absorbed by the water, and distil to dryness." *Lond.*—"Chloride of sodium, dried ℔ij.; sulphuric acid, ℥xx.; distilled water, f℥xxiv.; add the sulphuric acid, first mixed with f℥xij. of the water to the chloride of sodium put into a glass retort, pour what remains of the water into a receiver, and, the retort being fitted to it, let the acid distilled from a sand bath, pass over into this water, the heat being gradually increased." *Edin.*—"Purify muriate of soda by dissolving it in boiling water, concentrating the solution, skimming off the crystals as they form on the surface, draining from the adhering solution, and washing the crystals slightly with cold water; take of this salt previously well dried, of pure sulphuric acid, and of water, equal weights; put the salt into a glass retort, and add the acid previously diluted with a third part of the water, and allowed to cool; fit on a receiver which contains the rest of the water, distil with a gentle heat by means of a sand bath, or a naked coal-gas flame, so long as any liquid passes over, preserving the receiver cool by snow or a stream of cold water."

PHYSICAL PROPERTIES.—A limpid colourless liquid, with a yellowish tinge when not quite pure, having a suffocating odour, and an intensely acid, disagreeable taste. The specific gravity of the liquid acid of the Dublin and London Pharmacopœias is, 1·160, that of Edinburgh, 1·170.

CHEMICAL PROPERTIES.—It is a solution of muriatic acid gas (HCl.) in water; the Dublin and London preparation contains about 32 per cent of real acid, the Edinburgh about 34 per cent. Exposed to the air muriatic acid emits suffocating fumes which become white in contact with the vapour of ammonia; it possesses the usual characteristics of a strong acid.

*Adulterations.*—It should be of the prescribed density, that being a perfect test of its strength; it is frequently contaminated with iron and with chlorine, to the presence of either or both of which, is due the yellow colour of the impure acid; the former may be detected by solution of ferrocyanate of potash producing a blue precipitate with the neutralized acid; the latter by the acid dissolving leaf gold. The presence of sulphuric acid, an occasional impurity, is indicated by the solution of nitrate or muriate of baryta occasioning a white precipitate in the acid previously diluted.

THERAPEUTICAL EFFECTS.—As a caustic, muriatic acid has been used with much success to destroy the false membranes which are formed in diphtheritis, to check the spreading of the mortification in cancrum oris, to obstinate ulcers of the tongue, and in phagedenic ulceration of the tonsils. It has been also employed as an external application in hospital gangrene. It may be applied by means of a piece of sponge attached to a bit of whalebone.

In cases of poisoning with this acid, the antidotes are chalk, and magnesia or its carbonate, combined with demulcent and emollient drinks.

Acidum Nitricum, D. L. E.—*Nitric acid.*

Preparation.—*Dub.*—"Nitrate of potash, 100 parts; commercial sulphuric acid, 97 parts; mix in a glass retort and distil into a receiver fitted with an apparatus for receiving the elastic gas, until the residuum in the retort concretes and again liquefies." *Lond.*—"Nitrate of potash, dried; and sulphuric acid, of each, ℔ij.; mix in a glass retort, then let the acid distil in a sand bath." *Edin.*—"Purify nitrate of potash, if necessary, by two or more crystallizations, till nitrate of silver does not precipitate its solution in distilled water; put into a glass retort equal weights of this purified salt and of sulphuric acid, distil into a cooled receiver with a moderate heat from a sand bath or naked gas-flame, so long as the fused material gives off vapour; the pale yellow acid thus obtained, may be rendered colourless, should this be desired, by heating it gently in a retort."

Physical Properties.—A dense colourless liquid, (when not quite pure having an orange hue), with a powerful, disagreeable odour, and an intensely acid, caustic taste. The specific gravity of the acid of the Dublin pharmacopœia is 1·490; that of London and Edinburgh, 1·500.

Chemical Properties.—It is composed of anhydrous nitric acid ($NO^5$), and water; the Dublin preparation contains about 77 per cent of real acid, the London and Edinburgh about 80 per cent. Nitric acid emits white fumes in the air, which become much denser when mixed with the vapour of ammonia. It stains the cuticle yellow, and destroys whatever animal tissues it comes in contact with; it possesses the usual characteristics of a strong acid. The best test for distinguishing nitric acid from the other mineral acids, is its action on morphia or its salts, which it immediately turns deep orange.

Any slight adulterations which are met with in nitric acid are unimportant with reference to its medicinal use. The density is the best characteristic of its strength.

Therapeutical Effects.—As a caustic, strong nitric acid is employed, to destroy corns and warts, as an application to parts bitten by rabid animals, to poisoned wounds, and to phagedenic ulcers; more recently its application to certain forms of hemorrhoids has been very favourably mentioned by the late Dr. Houston of this city, (See *Dublin Journal of Medical Science*, vol. xxiii. p. 102.) In its application for any of the above purposes, the neighbouring parts should be smeared with olive oil or some resinous ointment so as to confine the action of the acid.

In cases of poisoning with this acid the antidotes are the same as for muriatic acid.

Acidum Sulphuricum. *Sulphuric acid* (described in the division *Astringents)*, possesses powerfully caustic properties, destroying the animal tissues wherever it is brought in contact with them. It is used as a caustic to the integument of the eyelid in *entropium* or inversion of the lid, and to the conjunctiva reflected on the eyelid in *ectropium* or eversion of the lid. It is also employed to destroy warts, and as an application to poisoned wounds. M. Velpeau speaks most highly of a caustic paste

prepared by mixing 2 parts of concentrated sulphuric acid with 1 part of saffron. He uses it chiefly as an application to cancerous and other malignant ulcerations.

Ammoniæ aqua fortior, E. Ammoniæ liquor fortior, L.—*Concentrated aqueous solution of ammonia; Strong ammonia.*—This preparation resembles in its physical properties that already described in the division *Antacids;* in its chemical properties it only differs in containing more ammonia, its density being 880°. In the London pharmacopœia, it is an article of the Materia Medica; in the Edinburgh, the same process is followed for both solutions; it is not contained in the Dublin pharmacopœia, but is commonly kept in the shops. It has been only used as a caustic in the bites of rabid animals, applied locally.

Antimonii murias; Antimonii sesquichloridum.—*Muriate or Sesquichloride of Antimony; Butter of Antimony*—The muriate of antimony is a deliquescent white salt, but as it is not employed in medicine, the following description refers to the article commonly met with in the shops under that name.

Preparation.—Either by dissolving sesquisulphuret of antimony *(Cinis antimonii)* in muriatic acid, and adding pernitrate of iron as colouring matter; or by dissolving crude antimony in muriatic acid with the heat of a little nitric acid.

Physical Properties.—A transparent liquid, of a deep reddish-yellow colour, having the odour of muriatic acid, and a strongly acid, caustic taste. Sp. gr. 1·2 to 1·5.

Chemical Properties.—It is composed of muriate of antimony, free muriatic acid, a little nitrous acid, muriate of iron, and water. It emits white fumes in the air; left exposed, it evaporates spontaneously leaving as a residuum, a white semi-crystalline mass; mixed with water it throws down a yellowish-white powder, formerly called *Powder of Algaroth,* (oxychloride of antimony). Solution of muriate of antimony has a powerfully acid reaction.

Therapeutical Effects.—It is employed as a caustic to parts bitten by rabid animals, its liquidity enabling it to penetrate into all parts of the wound; the parts should be first dried as well as possible with pieces of lint, as all liquids immediately decompose this preparation. Pure muriate of antimony has been used as an application to staphyloma by some German surgeons; a camel's hair pencil or a point of lint is dipped in the deliquescent salt and applied to the tumour until a whitish crust is perceived, when the whole is washed away by means of a large pencil dipped first into milk and afterwards into milk and water.

In cases of poisoning with this solution the same treatment should be employed as in poisoning with muriatic acid.

ARGENTI NITRAS, L. E. ARGENTI NITRAS FUSUM, D. ARGENTI NITRATIS CRYSTALLI, D.—*Nitrate of Silver; Lunar Caustic.*

PREPARATION.—"Take of silver (flattened into plates and cut, D.), 37 parts (℥iss., L. E.); nitric acid, (dilute, D.), 60 parts (f℥j., L. E.); (distilled water, f℥ij., L. E.); dissolve the silver in the diluted acid, in a glass vessel, with the aid of a gentle heat, and evaporate to dryness; liquefy this in a crucible with a slow fire, and pour into proper moulds (into iron moulds previously heated and greased slightly with tallow, E.); preserve in glass vessels." The crystallized nitrate, D. now never used, is prepared as the fused salt, but crystallized by evaporation and cooling.

PHYSICAL PROPERTIES.—A solid salt in the form of rods or pencils, smooth and polished on the surface, of the thickness of a writing pen. They have a crystalline fracture, and are of a grayish-slate colour, inodorous, with a bitter caustic and metallic taste.

CHEMICAL PROPERTIES.—Nitrate of silver is composed of one eq. of nitric acid, and one of oxide of silver, ($AgO, NO^5$). It is not deliquescent; it is soluble in its own weight of water at 60°, and in four parts of rectified spirit; heated it fuses, and by a red heat is decomposed and metallic silver is obtained. Exposed to light in contact with the smallest trace of organic matter, it becomes brown or blackish. It stains the cuticle black. The best test for nitrate of silver in solution is the addition of any of the soluble muriates, (as muriate of soda), a white curdy precipitate is formed which becomes black by exposure to strong light, and is soluble in ammonia but not in either cold or boiling nitric acid.

*Adulterations.*—Nitrate of silver, as met with in commerce, is frequently adulterated with nitrates of potash, lead, zinc, and copper, and with black oxide of manganese. The latter is detected by dissolving the salt in water, when it is left in the form of a black powder; the nitrates of lead, zinc, and copper, are detected by precipitating a solution of the salt with excess of muriate of soda, the precipitate is not entirely soluble in ammonia if lead be present, and the liquid part gives with sulphuretted-hydrogen a white precipitate if any zinc was present, but a black one if the impurity was copper. Nitre is detected by precipitating the silver with muriatic acid, filtering and evaporating, when if any be present, it will be obtained in the crystalline state.

THERAPEUTICAL EFFECTS.—As a caustic, nitrate of silver possesses many advantages over the other remedies of this class, and consequently is much more frequently employed; applied to the skin or to the mucous membranes, it produces a whitish stain which rapidly becomes greyish, and if exposed to light finally black; and at the same time the part to which it is applied is deprived of vitality. Its chief value as a caustic depends on its great manageableness in consequence of its solid form, on its property of not deliquescing, and on its mild but effectual action, the pain produced by it although sometimes acute being but of short duration: its uses are very numerous. It is employed to destroy warts, corns, and many small tumours; to check hemorrhage occurring from small vessels, as in the bleeding from leech-bites in children; to repress exuberant granulations; applied to the sound skin above the inflamed part, to stop the spread of erysipelas and erythema, to effect which it must

be applied freely so as to destroy the rete-mucosum as well as the cuticle. In the first stage of chancre when the ulcer is very minute, nitrate of silver applied freely, generally checks the disease and prevents it from spreading further; indeed in all sores about the prepuce or glans whether of syphilitic origin or not, its application is for the most part beneficial. In large indolent ulcers applied over the whole surface, it acts with excellent effect, in many instances as soon as the eschar which it produces peels off, the sore is found to be healed. As a topical application in the solid state or in the form of a strong solution, it is most valuable in ulcerations of the cornea, and in purulent and gonorrhœal ophthalmia; a weaker solution (gr. ij. to gr. v. to fʒi. of water) may be employed in both acute and chronic conjunctivitis; it is, however, liable to produce specks on the cornea or dark stains on the conjunctiva, as first observed by Professor Jacob of this city. Nitrate of silver has been also used in the solid state to remove strictures of the urethra and œsophagus, applied by means of a bougie into the point of which it is inserted *(armed or caustic bougie)*, but the practice is dangerous. In gonorrhœa occurring in females, a pencil of nitrate of silver is applied freely to the mucous membrane of the vagina, it is said with much benefit, and in the same disease in males an injection varying in strength from gr. ij. to gr. xx. dissolved in fʒj. of water is injected into the urethra; such treatment, however, is not unattended with danger. Nitrate of silver is also employed with benefit, as a topical application in many forms of ulcerations of the gums, the tongue and the fauces; in excoriations of the nipples, in the chronic stages of eczema, impetigo, and porrigo of the scalp; and in the acute stage of herpes preputialis, and herpes labialis. (See, *Tonics)*.

Arsenici oxydum album, D. Acidum Arseniosum, L. Arsenicum album, E.—*White oxide of Arsenicum; Arsenious acid; Arsenic.*

Preparation.—Arsenious acid is an article of the Materia Medica; it is prepared by roasting metallic ores in which the metal is contained, especially the arseniuret of cobalt, in a reverberatory furnace to which is attached a long chimney in a horizontal direction; it is deposited on the floor of the chimney in the form of a grey powder which is refined by sublimation. The Dublin College directs a re-sublimation for medical purposes, *Arsenici oxydum album sublimatum*, which, however, is not required in consequence of the good quality of what is met with in commerce in the present day.

Physical Properties.—In large, vitreous cakes or masses, whitish, sometimes having a yellow tinge; transparent, but on exposure to the air soon becoming opaque like enamel, the opacity gradually extending to the centre of the masses; the cakes are moderately hard and brittle. Arsenic is inodorous; it is also nearly tasteless, but when the tongue is kept for a few moments in contact with a piece of arsenic, a slightly bitter and acrid taste afterwards becoming sweetish may be perceived.

Its specific gravity, when transparent, is 3·738, and when opaque, 3·699.

Chemical Properties.—It is composed of 1 eq. of the metal arsenic, and three eq. of oxygen, (As $O^3$). Exposed to a heat of 380° F., it sublimes unchanged, and as it cools condenses into small transparent crystals of adamantine lustre, which are regular octohedrons. At ordinary temperatures, water dissolves from an 800th to a 400th of its weight of powdered arsenious acid; boiling water dissolves nearly a ninth of its weight, and on cooling to 60°, retains a 35th, (Christison). The solution reddens litmus paper slightly. The chemical characteristics of arsenious acid are as follows:—thrown on red hot charcoal or cinders it evolves a scarcely visible vapour, *metallic arsenic*, which has a strong alliaceous odour, and which at the distance of a few inches from the charcoal is converted into a dense white odourless smoke, *arsenious acid;* heated with carbonaceous matter in a glass tube, it is reduced and the metal sublimed, forming a greyish-black ring in a cooler part of the tube, and which by the application of heat to the outside of the glass, is resublimed in the form of arsenious acid; its solution precipitates lemon-yellow with ammoniacal nitrate of silver, grass-green with ammoniacal sulphate of copper, and sulphur-yellow with sulphuretted hydrogen; put into a proper apparatus, as Marsh's test tube, or a Döbereiner's lamp, with zinc and sulphuric acid, arseniuretted hydrogen will be evolved, which, being ignited as it passes through the fine aperture of the exit tube, deposits metallic arsenic on a plate of glass or porcelain held in the flame, and arsenious acid if held a little above the flame.

*Adulterations.*—Arsenious acid seldom contains any impurity; as sold in the form of powder, it is sometimes adulterated with chalk or sulphate of lime, or it may accidentally contain a little oxide of iron; any of them may be detected by the application of heat, which sublimes the acid and leaves the impurity.

Therapeutical Effects.—Arsenious acid is a powerful caustic, producing death of the part to which it is applied, which subsequently separates by sloughing; in consequence, however, of the danger which may occur from its absorption, it is but seldom employed in regular practice in the present day. The cases in which it has been found of use are, malignant or cancerous ulcerations especially of the skin of the face, in lupus, in onychia maligna, and in hospital gangrene. It may be applied in the form of ointment made with axunge or spermaceti, powdered opium being added to allay the pain it causes. Dangerous symptoms are less likely to arise from its absorption, if an ointment containing a tenth or a sixth of its weight of the acid be employed, than if a weaker preparation be used.—*Arsenical paste,* Cazenave. (Arsenic, 2 parts; sulphate of mercury, 1 part; animal charcoal, 2 parts; mix). When required for use, a few drops of water are added to this powder so as to form it into a thin paste, which is spread upon the surface to be acted on, which should never exceed an inch in diameter at each application.—*Arsenical caustic powder,* P. (Arsenic, 8 parts; dragon's blood, and cinnabar, of each, 15 parts; mix and reduce to a fine powder). This powder is made into a paste with a little saliva or gum-water just before it is applied. (See *Tonics*).

Cupri subacetas, D. Ærugo, L. E.—*Subacetate of Copper; Verdigris; Impure diacetate of Copper.*

Preparation.—An article of the Materia Medica, obtained by placing plates of copper in contact with the fermenting marc of the grape, or with cloths dipt in vinegar. The Dublin College directs this article to be prepared for medical use, *Cupri subacetas præparatum*, by a process similar to that for prepared chalk.

Physical Properties.—In coarse masses or in powder, of a beautiful bluish-green colour, with a disagreeable acetous odour, and a styptic, metallic taste.

Chemical Properties.—It is a mixture of the sesqui- and tribasic acetates of copper, sometimes containing also a proportion of the bibasic acetate. It is permanent in the air; heated it first loses water, then acetic acid, and the residue contains metallic copper; water resolves it into a soluble acetate, and an insoluble trisacetate. It is dissolved entirely by both sulphuric and muriatic acids.

*Adulterations.*—The slight impurities, metallic copper or earthy matters, present in commercial verdigris are of no importance; they may be detected by its solubility in sulphuric or muriatic acid.

Therapeutical Effects.—As a caustic it is applied to indolent ulcers, to venereal warts, and to fungous growths; it is also a useful application in ophthalmia tarsi; and in chronic diseases of the scalp, when they are of an indolent and obstinate character. It may be used in powder, or in either of the following forms:—*Unguentum cupri subacetatis*, D. *Unguentum æruginis*, E. (Subacetate of copper, in fine powder (prepared, D.), ℥ss. (℥i., E.); ointment of white resin, ℔j. (℥xv., E.); (olive oil, ℥i., D.); melt the ointment and add the verdigris "previously mixed with the oil," D.).—*Linimentum æruginis*, L. *Oxymel cupri subacetatis*, D. (Verdigris, in powder, ℥i.; vinegar, f℥vij.; honey (despumated), ℥xiv.; dissolve the verdigris in the vinegar, strain through a linen cloth; add the honey, and boil to a proper consistence). A mild caustic, applied to venereal ulcers of the mouth and tonsils, and to the ulcerated sore throat of scarlatina.

In cases of poisoning with verdigris, the best antidote is albumen.

Cupri carbonas.—*Carbonate of Copper.* This preparation obtained by precipitating a solution of sulphate of copper with carbonate of soda, though not contained in any of the British pharmacopœias deserves a short notice, in consequence of the success obtained from its use in the chronic forms of impetigo and eczema of the scalp, by M. Devergie in the *hôpital Saint Louis* at Paris; he employs it in the form of ointment, prepared by mixing intimately ℥ij. of the powder with ℥i. of axunge.

Cupri sulphas. *Sulphate of Copper* (described in the division *Astringents*) is used in the solid state as a caustic, to repress excessive granulations, to destroy venereal warts, and to excite a new action in indolent ill-conditioned ulcers; it is also applied with much benefit to chancres in their early stage.

### Hydrargyri nitras acidum. *Acid nitrate of mercury.*

Preparation.—Take, of pure mercury, 100 parts; commercial nitric acid, (Dens. about 1380.), 200 parts; dissolve the mercury in the acid with the aid of heat and evaporate the solution until it is reduced to 225 parts.

This preparation contains about 71 per cent of nitrate of mercury with an excess of nitric acid. It is a powerful caustic and is very much employed in the present day on the continent to destroy malignant ulcerations, particularly when of a cancerous character. It is applied by means of a camel's hair pencil, and the parts are then covered with lint.

### Hydrargyri oxydum nitricum, D. Hydrargyri nitrico-oxydum, L. Hydrargyri oxydum rubrum, E. *Nitric oxide of Mercury; Red oxide of Mercury; Red precipitate.*

Preparation.—*Dub.*—"Purified mercury, two parts; dilute nitric acid, three parts; dissolve the mercury, and increase the heat until the dry material is converted into red scales." *Lond.*—"Mercury, ℔iij.; nitric acid, ℔iss.; distilled water, Oij.; mix in a proper vessel, and with a gentle heat dissolve the mercury; boil away the liquor, and pulverize the residuum; put this into a shallow vessel, and apply a gentle heat, gradually increasing until red vapour ceases to arise." *Edin.*—"Mercury, ℥viij.; dilute nitric acid (D. 1280), f℥v.; dissolve half the mercury in the acid with the aid of a gentle heat, and continue the heat until a dry white salt be left; triturate the rest of the mercury with the salt till a fine uniform powder be obtained; heat the powder in a porcelain vessel, and constantly stir it, till acid fumes cease to be disengaged."

Physical Properties.—In brilliant, micaceous masses, varying in colour from orange-yellow to bright scarlet; inodorous, with a taste at first faintly, then strongly, caustic and metallic. Sp. gr. 11·074. In fine powder its colour is yellow.

Chemical Properties.—It is composed of 1 eq. of mercury, and 1 of oxygen, generally containing a little undecomposed nitrate of mercury; exposed to a red heat, the oxide of mercury is entirely volatilized in the form of oxygen and metallic mercury. It is very sparingly soluble in water, boiling water dissolving about a 7000th of its weight. It is very soluble in muriatic, acetic, and hydrocyanic acids; but is insoluble in alcohol.

*Adulterations.*—The nitric-oxide of mercury sometimes contains nitric acid, which is looked upon by the London and Edinburgh Colleges as an impurity; its presence is indicated by the ruddy fumes evolved when the salt is heated; it is often adulterated with red-oxide of iron, red-oxide of lead, or brick dust, they may be all detected by exposing the salt to a red heat, if pure it is entirely sublimed.

Therapeutical Effects.—As a mild caustic, this preparation is applied to indolent ulcers, to spongy granulations, to venereal warts, to the eyelids in chronic inflammation of their edges, &c. It may be used in powder, or in ointment as follows:—*Unguentum hydrargyri oxydi-nitrici*, D.—*Nitrico-oxydi*, L. (Nitric-oxide of mercury, ℥i.; white

wax, ℥ij.; prepared lard, ℥vj.; add the oxide in very fine powder to the wax and the lard melted together, and mix intimately).—*Unguentum oxydi hydrargyri*, E. (Red-oxide of mercury, ℥i.; axunge, ℥viij.; triturate them into an uniform mass).

Potassa caustica, D. Potassæ hydras, L. Potassa, E. *Caustic Potash; Hydrate of Potash; Potash.*

Preparation.—*Dub.*—"Take of solution of caustic potash, any quantity. Evaporate it in a very clean iron or silver vessel, until the ebullition having ceased, the saline matter on increasing the heat remains at rest. Pour the liquid potash on a silver or iron plate, and as soon as it becomes solid, divide it into convenient pieces, which are to be kept in well-closed bottles. The operator must avoid the drops spurted up during the evaporation." *Lond.*—"Take of solution of potash, cong. j.; evaporate the water in a clean iron vessel over the fire, until the ebullition being finished the hydrate of potash liquefies. Pour this into proper moulds." *Edin.*—"Take any convenient quantity of Aqua Potassæ, evaporate it in a clean and covered iron vessel, increasing gradually the heat, till there remains an oily looking fluid, a drop of which when removed on a glass-rod becomes hard on cooling; then pour out the liquid on a bright iron plate, and as soon as it solidifies, break it quickly and put it into glass bottles secured with glass stoppers."

Physical Properties.—In flat irregular pieces, or more generally in pencils or sticks of various lengths and about the thickness of a writing pen; grayish or bluish; inodorous; having a very acrid alkaline taste. Sp. gr. 1·8.

Chemical Properties.—It is composed of 1 eq. of potassium, 1 of oxygen, and 1 of water, (KO + HO); exposed to the air it deliquesces rapidly soon becoming liquid, and attracting carbonic acid at the same time is converted into the carbonate. It is soluble both in water and alcohol, water dissolving nearly an equal weight of it; during its solution heat is evolved. It possesses the properties of an alkali in an eminent degree.

*Adulterations.*—It generally contains various impurities, such as oxide of iron, silica, and sulphates and carbonates of potash; their presence, however, is of little consequence with reference to its medical uses. The iron and silica may be detected by dissolving in water or in alcohol; the sulphates and carbonates by the appropriate tests for sulphuric and carbonic acids.

Therapeutical Effects.—Caustic potash is a powerful caustic, but so unmanageable in consequence of its deliquescent property, that it is not often employed. Its chief use is for making an issue, which is effected by covering the part with two or three layers of adhesive plaster, in the centre of which an aperture is cut of the size of the intended issue; the caustic potash is rubbed on the part until the surface is destroyed; a linseed meal poultice is then applied, and when the slough separates a pea is inserted. For producing issues, however, the following preparation is preferred by many, as being more manageable, in consequence of its not being so deliquescent:—*Potassa (caustica, D.) cum calce*, D. E. (Evaporate any convenient quantity of Aqua Potassæ in a clean, covered,

iron vessel to one-fourth (one-third, E.) its volume; and add slaked lime, till the fluid has the consistence of a firm pulp; preserve in well-closed vessels).—L. (Hydrate of potash, and lime, of each, ℥i.; rub together and keep in a well-stopped vessel). The preparation of the London College is made into a paste with rectified spirit before it is used.—*Caustic of Filhos.* This preparation is exceedingly useful for cauterizing the neck of the uterus, and is also very generally employed by French surgeons for many other purposes. Some nicety is required for its formation: tubes of lead from 3 to 4 lines in diameter and from 1 to 2 yards in length, are procured, and divided into pieces of a convenient length by means of a piece of cord attached at both extremities to a fixed point, and rolled evenly around the tube where it is wished to cut it. By this method the parietes of the tube are bent inwards and a small opening only left which is easily closed by means of a hammer and a mandril introduced into the tube; great care must however be taken that the smallest fissure be not left as this would render the tube useless. The tubes thus prepared are placed in sand or moist clay and filled with the following caustic:—Heat 120 parts of *Potassa cum calce* in a clean iron spoon until it is perfectly fused, when the spoon acquires a dull red heat; and add to it gradually 40 parts of fresh quick lime, stirring with an iron rod, until the whole is intimately mixed. It must be poured while fluid into the tubes. When cold, the parietes of the tubes are thinned with a file as much as possible, care being taken not to penetrate them. These caustic pencils are kept in glass tubes with a little finely powdered quick lime, the orifices being securely closed with corks, a little cotton being placed between the cork and the pencil.—*Caustic powder of Vienna;* (Take of *Potassa cum calce,* 50 parts; quick lime, 60 parts; powder the two substances separately in a warm mortar, and mix them intimately and rapidly; keep in well stoppered bottles). When required for use, this powder is made into a soft paste with a little spirit and applied to the part it is wished to cauterize.

In cases of poisoning with caustic potash, the best antidotes are, vinegar, lemon-juice, or the fixed oils.

### Zinci chloridum.—*Chloride of Zinc; Butter of Zinc.*

Preparation.—By dissolving metallic zinc in muriatic acid, with the aid of a little nitric acid, evaporating to dryness in a porcelain capsule, dissolving the chloride thus obtained in water, adding a small quantity of prepared chalk, filtering after 24 hours' rest, and evaporating to dryness; the product must be preserved in well-stopped bottles.

Physical Properties.—In solid pieces, snow-white; inodorous; having a strongly styptic metallic taste.

Chemical Properties.—It is composed of 1 eq. of chlorine, and 1 of metallic zinc, (Zn Cl); exposed to the air it deliquesces rapidly, being said by many chemists to be the most deliquescent of salts. It is fusible at 212°, and is volatilized at a red heat. It is soluble in water, alcohol and ether.

Therapeutical Effects.—Chloride of zinc is a powerful caustic, destroying the vitality of the part with which it is placed in contact; the process being attended with violent burning pain which lasts for five or six hours. It has not been much employed in this country, but on the continent it is in very general use, for the formation of issues; to destroy fungous growths, *nævi materni*, &c.; and as an application to open cancer, in which disease it is said to be productive of the best effects, by inducing a new action in the neighbouring parts; it has been also applied to fungus hæmatodes, and to various forms of malignant ulcerations. In tooth-ache caused by caries, a minute portion of chloride of zinc introduced into the cavity of the tooth, the carious parts having been previously removed with a silver probe, affords almost immediate relief, the neighbouring parts must be protected with lint, and a small portion of lint is to be put into the hollow of the tooth after the chloride has been applied.

It may be used in the form of lotion, prepared by dissolving the salt in distilled water in different proportions according to the effect required to be produced; or in the form of paste, made by mixing the chloride with from two to five parts of flour. In applying the paste of chloride of zinc, a small space only should be covered with it at a time, and it should be spread in a layer not thicker than from one to two lines. It may be left on from six to eight hours.

# CHAPTER VII.

## DIAPHORETICS.

### (Sudorifics; Diapnoïcs.)

Medicines which augment the cutaneous exhalation are called Diaphoretics; when they increase it to such a degree as to produce sweating, they are called Sudorifics; but as the same remedies are capable of producing both effects, which differ in degree only, we have included them under the one title. Obstructed perspiration, or diseases in which diaphoresis will prove useful, may be associated with fever and inflammation, or may occur with a slow languid circulation; the former is indicated by the morbid heat of the surface of the body, and by increased vascular action; the latter by the coldness of the surface, and by general depression of the circulation. It is evident, therefore, that very different remedies will act as diaphoretics in these opposite states of the system. In the former case, those medicines are to be selected for use, which appear to act by relaxing the morbid constriction of the

cutaneous capillaries, and at the same time have a direct tendency to lower the action of the heart and arteries; such as *antimonials*, and the *alkaline* and *saline diaphoretics*. In the latter, those remedies are to be employed, which act as stimulants to the cutaneous capillaries, and at the same time increase the general action of the vascular system. In addition to the medicines described in this division, other means are resorted to for the production of diaphoresis; the more important of these are increased muscular action, warm water and warm vapour or air baths, the cold affusion, and the use of tepid diluent drinks as simple water, gruel, whey, &c. During the administration of diaphoretics, it is essential, that the surface of the body should be kept warm, and for this purpose a bad conductor of heat, such as flannel, should be employed; care also must be taken to avoid the application of cold, either by exposing the surface of the body to cold air, or by the use of cold drinks while the perspiration continues, or for some time after it has ceased; lastly, where it is wished to check the diaphoresis, this must be done gradually, by drying the surface of the body with dry, warm towels, by diminishing the covering, and by cautiously exposing the hands and arms to the air.

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Ammoniæ acetatis aqua, D. E. Ammoniæ acetatis liquor, L.—*Solution of acetate of ammonia; Mindererus Spirit.*

Preparation.—*Dub.*—"Carbonate of ammonia, one part; add by degrees, frequently agitating, sufficient warm distilled vinegar to saturate the ammonia, that is about 30 parts; this may be determined by means of litmus paper." *Lond.*—"Sesquicarbonate of ammonia, ℥ivss., or a sufficiency; distilled vinegar, Oiv.; add the salt to the vinegar to saturation." *Edin.*—"Distilled vinegar, from French vinegar in preference, f℥xxiv.; carbonate of ammonia, ℥i.; mix and dissolve the salt; if the solution has any bitterness, add by degrees a little distilled vinegar, till that taste be removed; the density of the distilled vinegar should be 1·005, and that of the aqua acetatis ammoniæ, 1·011."

Physical Properties.—A transparent colourless liquid, with a very faint odour, and a cooling saline taste. The specific gravity varies with the strength of the solution, that of the Dublin and Edinburgh is 1.011; that of London somewhat higher.

Chemical Properties.—It consists of acetate of ammonia dissolved in water, the proportion of the acetate present varies exceedingly, depending on the strength of the distilled vinegar employed in the preparation. The solution should be perfectly neutral, but is usually faintly acid which is an advantage in relation to its employment in medicine. By careful evaporation crystals of the salt may be obtained, they are

very deliquescent. By adding a few drops of sulphuric acid to the solution, an acetous odour is evolved; caustic potash disengages an ammoniacal odour.

*Adulterations.*—This solution seldom if ever contains any impurity, the London and Edinburgh Colleges, nevertheless, have given tests for detecting the presence of metallic matter, and sulphuric or muriatic acids:—the metals, by sulphuretted hydrogen, and the acids, the former by muriate of baryta, the latter by nitrate of silver. The solution should be perfectly colourless and of the prescribed density.

Therapeutical Effects.—Water of acetate of ammonia operates as a diaphoretic with much certainty, and is very generally employed with that intention in febrile and inflammatory affections. Its operation should be promoted by the use of warm drinks and by the surface of the body being kept warm, as otherwise it is apt to pass of by the kidneys. This solution possesses the advantage of not exciting the circulation in any considerable degree, a property which renders it peculiarly adapted for febrile diseases.

Dose and Mode of Administration.—f℥ss. to f℥i., or f℥ij., repeated every five or six hours.—*Diaphoretic mixture.* (Solution of acetate of ammonia, f℥ij.; simple syrup, f℥j.; orange flower water, f℥i.; camphor mixture, f℥iv.; mix). Dose, f℥j. every four hours.

Incompatibles.—Acids; potash, and soda, and their carbonates; lime water; nitrate of silver; acetate of lead; and the metallic sulphates.

Antimonii oxidum, E. Antimonii oxydum nitromuriaticum, D.—*Sesquioxide of antimony; Nitromuriatic oxide of antimony.*

Preparation.—*Dub.*—"Prepared sulphuret of antimony, 20 parts; muriatic acid, 100 parts; nitric acid, 1 part; add the sulphuret gradually, to the acids previously mixed in a glass vessel, avoiding the vapours; digest with a gradually increased heat, till the mixture ceases to effervesce, then boil for an hour; pour the cooled and filtered liquor into a gallon of water; when the oxide of antimony shall have subsided, wash with a large quantity of water, till the decanted fluid shall have become free from acid, which may be ascertained by means of litmus paper; finally dry the oxide on bibulous paper." *Edin.*—"Sulphuret of antimony, in fine powder, ℥iv.; muriatic acid (commercial), Oj.; water, Ov.; dissolve the sulphuret in the acid with the aid of a gentle heat; boil for half an hour; filter; pour the fluid into the water; collect the precipitate on a calico filter; wash it well with cold water; then with a weak solution of carbonate of soda; and again with cold water till the washings cease to affect reddened litmus paper. Dry the powder over the vapour bath."

Physical Properties.—A heavy white powder, sometimes semi-crystalline; inodorous, having a disagreeable metallic taste as prepared according to the Dublin pharmacopœia, in consequence of adhering chloride of antimony, but perfectly tasteless when freed from chlorine.

Chemical Properties.—It is composed of 1 eq. of antimony, and 3 of oxygen, ($Sb\ O^3$) Graham; with some adhering chloride of antimony in the Dublin preparation. It is permanent in the air, exposed to heat it becomes yellow, and fuses at a red heat, concreting slowly as it cools into

a crystalline mass; by a stronger heat it is sublimed in white vapours which condense in the form of crystalline needles. Oxide of antimony is insoluble in water; the greater part, but not all, of the adhering chloride may be removed from the nitromuriatic oxide by repeated washing with water; washed with a weak solution of carbonate of soda, it may be completely freed from it. It is soluble in muriatic, tartaric, and acetic acids.

*Adulterations.*—Not liable to any; that it has been properly prepared is shown by the tests of the Edinburgh Pharmacopœia: "Entirely soluble in muriatic acid, and in a boiling mixture of bitartrate of potash and water, fusible at a red heat."

Therapeutical Effects.—Originally introduced into the Dublin pharmacopœia only for the preparation of tartar emetic; but of late years it has been used as a diaphoretic in the same cases as James' powder, which it appears to resemble much in its action on the system, and which is explained in the next article.

Dose and Mode of Administration.—Gr. iij. to gr. x.; in some instances so large a dose as ʒss. has proved inert, this however may be owing to faulty preparation. It may be given in the form of pill made with conserve of roses.

### Antimonii pulvis compositus, L. Pulvis antimonialis, D. E.—*Antimonial powder.*

Preparation.—The process for preparing James' powder is a secret with the proprietor of the nostrum; that for antimonial powder is nearly similar in the three British pharmacopœias, and is as follows:—*Dub.*—"Prepared sulphuret of antimony, 1 part; hartshorn shavings, 2 parts; mix and throw them into a wide iron pot heated to redness, stirring constantly till vapours of sulphur cease to arise, and the mixture shall have acquired an ash-grey colour; rub the cooled mass to powder, and put it into a crucible and expose it for two hours to a heat gradually increased to whiteness. Finally, when cold reduce to a very fine powder." *Lond.*—"Sesqui-sulphuret of antimony, powdered, ℔j.; horns, shaved, ℔ij.; mix and throw them into a crucible red hot in the fire, and stir constantly till vapour no longer arises. Rub that which remains to powder, and put it into a proper crucible. Then apply fire, and increase it gradually that it may be red hot for two hours. Rub the residue to very fine powder." *Edin.*—"Sulphuret of antimony, in coarse powder; and hartshorn shavings, of each, equal parts; mix and put them into a red hot iron pot, and stir constantly till they acquire an ash-grey colour, and vapour no longer arises. Pulverise the product, and put it into a crucible with a perforated cover, and expose this to a gradually increasing heat till a white heat be produced, which is to be maintained for two hours. Reduce the product when cold to a fine powder."

Physical Properties.—A dull white powder, tasteless and odourless; feeling gritty under the teeth in consequence of its being in general rather coarsely powdered. The empirical preparation "James' powder," as a succedaneum for which this preparation was originally introduced into the pharmacopœias, resembles it both in physical and chemical properties, except in being in a state of much more minute division.

Chemical Properties.—According to the recent and accurate experiments of Dr. Douglas Maclagan of Edinburgh, the composition of both

preparations appears to be similar, but the proportions of the different ingredients present, vary remarkably in different specimens. They consist of from ½ to 2½ per cent of the antimonite of lime, and from 4 to 10 per cent of sesquioxide of antimony, to the presence of both of which, chiefly the latter, the activity of the preparation is due; the remainder being inert antimonious acid, and phosphate of lime. Boiling water dissolves the antimonite of lime which is deposited as the solution cools; muriatic acid dissolves the sesquioxide of antimony and the phosphate of lime.

Not liable to adulteration; but as before remarked, it varies much in activity, the empirical preparation being more uniform in character and consequently more generally preferred notwithstanding its high price.

Therapeutical Effects.—Antimonial powder and James' powder, though frequently even in very large doses not producing the least apparent effect on the system, more generally operate as powerful diaphoretics, causing copious sweating without much excitement or disturbance of the circulation. They are generally employed in the early stages of febrile diseases and in inflammatory affections; they have been also given in chronic skin diseases, and combined with calomel and opium in acute rheumatism. In consequence of the uncertainty of their operation, and the very high price at which the patent nostrum is sold, most practitioners at present prefer employing tartar emetic, from which, when administered with proper regulation of the doses, we can obtain similar effects with much greater certainty. The late Dr. Cheyne employed James' powder with excellent effect in the after treatment of apoplexy, to equalise the circulation and thereby prevent a return of the fit; and his practice has been very generally adopted by the physicians of this city with the most beneficial results. He at first gave two grains for a dose at bedtime and increased it half a grain every night, until eighteen grains were taken at one dose, unless vomiting or purging were previously produced by it.

Dose and Mode of Administration.—In powder, from gr. iij. to gr. x., repeated every four or five hours; or it may be made into pill with conserve of roses or any of the vegetable extracts.—*Diaphoretic pill;* (Antimonial or James' powder, gr. ij.; extract of conium or of aconite, gr. i.; to be made into one pill). It should be repeated every six hours.

Antimonii sulphuretum, D. E. Antimonii sesquisulphuretum, L.—*Sulphuret of antimony; Crude antimony.*

Preparation.—An article of the Materia Medica in the three British pharmacopœias; prepared by fusing the ore in a perforated crucible placed over another destined to receive the melted mass; the Dublin College directs it to be further purified by the process of levigation and elutriation as for prepared chalk, *(Antimonii sulphuretum præparatum)*

Physical Properties.—In conical masses or loaves, of a bluish-grey colour, staining the fingers or paper black, with a brilliant, metallic, crystalline fracture; it is inodorous and tasteless, is easily pulverized, and yields a black powder. Sp. gr. 4·6.

Chemical Properties.—It is composed of 1 eq. of antimony, and 3 of sulphur, (Sb + 3 S) Graham. It is permanent in the air, exposed to a moderate heat it fuses, and at a red heat it volatilizes. It is insoluble in water; with the aid of heat it is completely dissolved by muriatic acid with the disengagement of sulphuretted-hydrogen gas.

*Adulterations.*—Although not liable to adulteration, as met with in commerce it contains many impurities; most of these are detected by dissolving in muriatic acid; but there is one of much importance which this test will not detect, and which is seldom wanting, namely, arsenic: its presence may be shown by the reduction test as before described for arsenic (page 120), the sulphuret having been previously mixed with charcoal and carbonate of soda.

Therapeutical Effects.—This preparation is at present not used in medicine, it was formerly administered as a diaphoretic in doses of from gr. x. to ʒij., in cutaneous and scrofulous diseases, and in gout and rheumatism. It is employed in pharmacy for preparing the other antimonial compounds.

Antimonii sulphuretum aureum, E. Suphur antimoniatum fuscum, D. Antimonii oxysulphuretum, L.—*Golden sulphuret of antimony; Oxysulphuret of antimony.*

Preparation.—*Dub.*—"Prepared sulphuret of antimony, 1 part; water of caustic potash, 18 parts; dilute sulphuric acid, 11 parts or a sufficiency; add the sulphuret to the water of caustic potash, and boil for an hour; filter the warm liquor through doubled linen, and drop it into the dilute sulphuric acid; wash away the sulphate of potash with warm water; dry the golden sulphuret and reduce to a fine powder." *Lond.*—"Sesquisulphuret of antimony, powdered, ʒvij.; solution of potash, Oiv.; distilled water, cong. ij.; dilute sulphuric acid, a sufficiency; mix the sesquisulphuret of antimony, solution of potash and water together; and boil with a slow fire for two hours, frequently stirring, distilled water being often added, that it may fill about the same measure; strain the liquor, and gradually drop into it as much diluted sulphuric acid, as may be sufficient to throw down the oxysulphuret of antimony; then wash away the sulphate of potash with water, and dry what remains with a gentle heat." *Edin.*—"Sulphuret of antimony, in fine powder, ʒi.; solution of potash, fʒxj; water, Oij; mix the water and solution of potash, add the sulphuret, boil for an hour, filter immediately, and precipitate the liquid while hot, with an excess of diluted sulphuric acid; collect the precipitate on a calico filter, wash it thoroughly with water, and dry it with a gentle heat."

Physical Properties.—A light powder of a bright orange colour, odourless and tasteless when pure.

Chemical Properties.—Its chemical composition has not been accurately ascertained; in the Edinburgh Pharmacopœia it is stated to be a mixture or compound of sesquisulphuret of antimony, sesquioxide of antimony, and sulphur. It is permanent in the air, heated in close vessels, sulphur is sublimed; but if heated in contact with air it burns with a greenish-blue flame, evolving sulphurous acid and leaving a greyish residuum. It is insoluble in water, and only partially soluble in dilute acids; with the aid of heat it is nearly all dissolved by solutions of the alkalies.

*Adulterations.*—This preparation often contains oxide of iron and sulphur, and is frequently coloured with Brazil-wood or red saunders-wood: all these impurities are readily detected by the tests of the Edinburgh College: "twelve times its weight of pure muriatic acid, aided by heat, dissolves most of it, forming a colourless solution and leaving a little sulphur."

Therapeutical Effects.—The golden sulphuret of antimony possesses diaphoretic properties, in large doses producing nausea and vomiting; it is seldom employed alone, but, in the following preparation, is in very general use as a diaphoretic and alterative.—*Pilulæ Calomelanos compositæ*, D. E. (Calomel; and golden sulphuret of antimony, of each, one part; guaiacum resin, in fine powder, two parts; make into a pill mass with a sufficiency (two parts, E.) of treacle; "to be divided into six grain pills," E.).—*Pilulæ Hydrargyri Chloridi compositæ*, L. (Chloride of mercury; oxysulphuret of antimony, of each, ʒij.; guaiacum resin, powdered, ℥ss.; treacle, ʒij.; rub the chloride of mercury with the oxysulphuret of antimony, afterwards with the guaiacum resin and the treacle until incorporated). This compound is commonly known as *Plummer's Pill;* it is an excellent diaphoretic and alterative, well adapted for cutaneous eruptions, especially those of a syphilitic origin; Dose, gr. v. to gr. x. or gr. xv. Six grains (four grains, L.) contain one grain each of calomel and of the golden sulphuret of antimony.

Incompatibles.—Acids; and acidulous salts.

Antimonii et potassæ tartras *sive* tartarum emeticum, D. Antimonii potassio-tartras, L. Antimonium tartarizatum, E. *Tartrate of antimony and potash; Tartar emetic.*

Preparation.—*Dub.*—"Nitromuriatic oxide of antimony, 4 parts; bitartrate of potash, in fine powder, 5 parts; distilled water, 34 parts, boil the water in a glass vessel; throw gradually into it, the oxide and bitartrate of potash previously mixed together, and boil for half an hour; then filter the liquid through paper and cool gradually that crystals may be formed." *Lond.*—"Sesquisulphuret of antimony, in powder; nitrate of potash, powdered, of each, ℔ij.; bitartrate of potash, powdered, ℥xiv.; hydrochloric acid, f℥iv.; distilled water, cong. j.; mix accurately the sesquisulphuret of antimony with the nitrate of potash; the hydrochloric acid being then added, and the powder spread upon an iron plate, ignite it; rub the residue to very fine powder when it is cold, and wash it frequently with boiling water until it is free from taste; mix the powder thus prepared with the bitartrate of potash, and boil for half an hour in the distilled water; strain the liquor while hot, and set it aside that crystals may be formed; these being removed and dried, let the liquor again evaporate that it may yield crystals." *Edin.*—"Sulphuret of antimony, in fine powder, ℥iv.; muriatic acid (commercial), Oj.; water, Ov.; dissolve the sulphuret in the acid with the aid of a gentle heat; boil for half an hour, filter, pour the liquid into water, collect the precipitate on a calico filter, wash it with cold water, till the water ceases to redden litmus paper; dry the precipitate over the vapour bath. Take of this precipitate, ℥iij.; bitartrate of potash, ℥iv.¼.; water, f℥xxvij.; mix the powders, add the water, boil for an hour, filter and crystallize by cooling. The mother liquor when concentrated yields more crystals not so free from colour, and therefore requiring a second crystallization."

Physical Properties.—Tartar emetic is met with in the shops either in the form of a white powder, or in transparent colourless crystals, which are octahedrons with a rhombic base. It is inodorous, but has a styptic nauseous taste.

Chemical Properties.—It is composed of one eq. of tartrate of potash, one eq. of tartrate of antimony, and two eq. of water, (KO, Sb $O^3$, 2 ($C^8$ $H^4$ $O^{10}$) + 2 HO). The crystals effloresce in the air soon becoming white and opaque, and losing their water of crystallization. Strongly heated the salt is decomposed, and an alloy of antimony and potash is obtained. It is soluble in 14 times its weight of cold water, and in less than twice its weight of boiling water; it is insoluble in alcohol. The solution gives *white* precipitates with oxalic and sulphuric acids, caustic potash, and lime water; *straw coloured* with infusion of nutgalls; and *bright orange-red* with sulphuretted hydrogen or the soluble hydrosulphates; the latter is the most characteristic test.

*Adulterations.*—In the crystalline state, this salt is seldom adulterated; in a few instances I have found crystals of sulphate of potash mixed with those of tartar emetic, evidently an intentional fraud, but one easy of detection, as crystals of tartar emetic when dropped into a solution of sulphuretted hydrogen have an orange-coloured deposit formed on them. The powder is very commonly adulterated with cream of tartar, and from being badly prepared frequently contains a large quantity of the oxide of iron; both impurities are readily detected by the tests of the Edinburgh Pharmacopœia: "Entirely soluble in 20 parts of water, solution colourless and not affected by solution of ferrocyanide of potassium; a solution in 40 parts of water is not affected by its own volume of a solution of 8 parts of acetate of lead in 32 parts of water, and 15 parts of acetic acid."

Therapeutical Effects.—In properly regulated doses, tartar emetic produces diaphoresis more uniformly and more certainly than any other of the antimonial preparations; nausea sometimes accompanies its diaphoretic action, but this is attended with the advantage of placing the system in a condition in which sweating is more freely produced. In all the varieties of febrile diseases, especially when a determination of blood to the head forbids the use of the more stimulating diaphoretics, tartar emetic is employed with great benefit. It has been also used with much advantage in obstinate cutaneous diseases, administered in decoction of sarsaparilla, or in decoction of elm bark if much debility be present. The employment of the antimonial preparations generally is contraindicated in diseases where gastric irritation is present. (See *Emetics* and *Sedatives*).

Dose and Mode of Administration.—1-12th to 1-6th of a grain frequently repeated; it may be administered dissolved in a large quantity of distilled water without any flavouring adjunct; thus, gr. ij. may be dissolved in Oj. of water, and f℥i. of this taken every hour until sweating is produced; given in the form of pill, however, it is less apt to produce vomiting than when in solution. The following is used as a substitute for James' powder.—Tartar emetic, gr. i.; sulphate of potash, in fine powder, gr. xx.; mix. Dose, gr. ij. to gr. iij., every hour.—*Liquor Tartari Emetici*, D. *Vinum Antimonii Potassio-tartratis*, L. *Vinum*

*Antimoniale*, E. ("Tartar emetic, ℈i.; boiling distilled water, *by measure* ℥viij.; rectified spirit of wine, *by measure* ℥ij.; dissolve in the water, filter and add the spirit," D. "Dissolve gr. xl. of tartar emetic in Oj. of sherry," L. E.). Every fluid ounce contains gr. ij. of tartar emetic; Dose as a diaphoretic, min. xx. to min. xxx., every hour.

Incompatibles.—The acids; the alkalies, and their carbonates; lime water; chloride of calcium; the earths; some of the metallic oxides; hydrosulphurets; the acetates of lead; corrosive sublimate; decoctions and infusions of most of the bitter and astringent vegetables, as those of cinchona, rhubarb, galls, catechu, &c. The solution in water spoils by keeping.

Arctium lappa, semina, radix, D.—*Common Burdock; The seeds and root of Arctium lappa* (*Lappa minor*, Decandolle). This is an indigenous plant growing commonly in waste places and by road sides. It belongs to the Natural family *Compositæ* (*Asteraceæ*, Lindley), and to the Linnæan class and order *Syngenesia Æqualis*.

This plant, though still retained in the Dublin pharmacopœia, in the present day is never employed in regular practice. A decoction of the root is a popular diet drink in chronic cutaneous diseases, and in rheumatism. It produces gentle diaphoresis and also increases the flow of urine. Guibourt has found *Inulin* in the root of burdock.

Dulcamara, L. E. Solanum dulcamara, caules, D. *The stems (twigs, E.) of Solanum dulcamara; Woody nightshade; Bitter-sweet.*—Indigenous, growing in hedges and thickets. It belongs to the Natural family *Solanaceæ*, and to the Linnæan class and order *Pentandria Monogynia*.

Botanical Characters.—Stems, shrubby, twining and branching; Leaves, cordate, upper ones hastate; Flowers, elegant, purple, in drooping clusters; Anthers, large, yellow, united into a pyramidal or cone-shaped figure; Berries, scarlet, juicy.

Preparation.—The stems or twigs are gathered in autumn when the leaves have fallen off, and dried with the heat of a stove. Those stems of the thickness of a goose-quill are usually selected.

Physical Properties.—The twigs, as met with in the shops, are dark brown externally, white within, light and spongy in the centre; when fresh they have a faintly nauseous odour, which is lost by drying; the taste is at first bitter, afterwards sweetish, whence the name bitter-sweet is applied to the plant.

Chemical Properties.—According to the analysis of Desfosses, dulcamara contains, besides some salts of lime and potash and other unimportant substances, a peculiar alkaline principle, insoluble in water, soluble in alcohol and ether, pulverulent, inodorous, white, permanent in the air, which he has called *Solania*—it appears to be a narcotic, but its

medical properties have not been yet fully examined. Bitter-sweet yields its active properties to both water and alcohol.

Therapeutical Effects.—A decoction has been employed as a diaphoretic in rheumatic and venereal affections, and in chronic diseases of the skin. Its medical properties are, however, very feeble, and in the present day it is scarcely ever used.

Dose and Mode of Administration.—*Decoctum Dulcamaræ*, D. L. E. (Dulcamara twigs, chopped, ʒi.; water, fʒxxiv.; boil down to fʒxvj.; and strain). Dose, fʒi. to fʒij. two or three times a day.

Guaiaci lignum, D. L. E.—*Wood of Guaiacum officinale; Lignum-vitæ.*

Guaiaci resina, D. L. Guaiacum, E.—*Resin (obtained by heat from the wood, E.) of Guaiacum officinale.* This tree is a native of Jamaica, of St. Domingo, and of many other West India islands; it belongs to the Natural family *Zygophyllaceæ*, and to the Linnæan class and order *Decandria Monogynia.*

Botanical Characters.—A tree attaining a height of 30 or 40 feet, with a crooked stem, and a hard, heavy wood; Leaves evergreen, bijugate; Flowers, pale blue, in clusters in the axillæ of the upper leaves; Fruit, yellow, obovate, coriaceous.

Preparation.—The wood is divided into logs or billets; and the resin is obtained, as a spontaneous exudation from cracks or fissures in the stem, or by incisions made into it; or artificially procured, by heating one end of billets of the wood which have been previously bored lengthwise, until the resin flows out of the opposite extremity; or by boiling the chips and raspings of the wood in a strong solution of common salt, when the resin swims on the surface of the liquid.

Physical Properties.—Guaiacum wood, commonly termed Lignum-vitæ, is imported in logs or billets about nine inches in diameter and of various lengths; it is extremely hard, consisting of an outer circle of young wood *(alburnum)* of a pale yellow colour, and a centre of old wood *(duramen or heart-wood)* of a dark green colour; its density is 1·333, so that it sinks when thrown into water. For medical uses the wood is rasped or shaved into coarse powder *(scobs vel rasura guaiaci)*; in which state it has an acrid resinous taste, and a peculiar aromatic odour. Guaiacum resin is a semi-transparent solid, breaking with a vitreous fracture, the fractured surface varies much in colour, being partly brownish, partly reddish, and partly greenish, but it always becomes green when exposed to the light and air. The odour and taste are similar to, but stronger than those of the wood. The Sp. gr. is 1·29.

Chemical Properties.—Guaiacum wood consists of a peculiar acrid principle, and its proper resin, besides gummy matter, mucous extractive, lignin, &c. Its active properties are probably due to the acrid matter as well as to the resin. The latter, the physical properties of which have been described above, as met with in commerce consists of the true resin—*guaiacic acid*, with a trace of gum, extractive matter, and woody

fibre; it is insoluble in water and in the fixed oils, but is soluble in alcohol and in solutions of the alkalies The alcoholic solution is precipitated by water and by muriatic acid, but not by acetic acid; nitric acid occasions no change at first, but after some hours the liquid becomes green, then blue, and at last a brown precipitate falls down; dropped on flour or on a transverse slice of a potato, a blue colour is produced on exposure to the air. Guaiacum resin is fused by heat.

*Adulterations.*—Various resinous substances are frequently mixed with, or substituted for, guaiacum; the substitution may be readily detected by applying the tests of the Edinburgh Pharmacopœia for the true resin.—"Fresh fracture red, slowly passing to green. The tincture slowly strikes a lively blue colour on the inner surface of a thin pairing of a raw potato." The adulteration with colophony or any of the pine resins may be detected by the partial solubility of the suspected article in hot oil of turpentine, which does not act on the true resin. The shavings may be readily distinguished from those of any other wood by the action of nitric acid, which communicates to them a temporary bluish-green colour.

Therapeutical Effects.—Guaiacum wood and its resin are stimulating diaphoretics, and are consequently inadmissible in all states of excitement or acute inflammation of the system. They are well adapted for chronic rheumatism of the old or debilitated; for the atonic stages of gout; for chronic diseases of the skin, especially those of a syphilitic origin, or occurring in scrofulous habits; and for all the forms of secondary syphilis, provided there is no irritation or inflammatory tendency in the alimentary canal. When first introduced into the practice of medicine, they were believed to possess antivenereal virtues, little if at all inferior to mercury.

Dose and Mode of Administration.—The resin may be given in powder in doses of from gr. x. to ʒss.; it may be administered in the form of bolus made with treacle or conserve of roses; or suspended in water by means of mucilage. The wood is not administered in powder.—*Decoctum Guaiaci*, E.—*compositum*, D. (Guaiac turnings, ʒiij.: sassafras root, cut (rasped, E.), ʒx. (ℨj., E.); liquorice root, bruised, ʒiiss. (ℨj. E.; raisins, ʒij., E.); water, *by measure* ℔x. (Oviij., E.); boil the guaiac (and raisins, E.) in the water down to one half (Ov., E.), adding the liquorice and sassafras towards the close and strain). The old *decoction of the woods*, a sudorific in doses of fℨiv., two or three times a day.—*Aqua Calcis composita*, D. (Guaiac-shavings, ℔ss.; liquorice root, cut and bruised, ℨj.; sassafras bark, bruised, ℨss.; coriander seeds, ʒiij.; lime water, *by measure* ℔vi.; macerate without heat for two days in a close vessel, frequently shaking, then strain). Seldom used at present. Dose, fℨij. to fℨiv.—*Mistura Guaiaci*, L. E. (Guaiacum resin, ʒiij.; sugar, ℨss.; mucilage, fℨss.; cinnamon water, fℨxix.; rub the guaiac with the sugar and mucilage, adding gradually the cinnamon water). Dose, fℨss. to fℨij., two or three times a day.—*Tinctura Guaiaci*, D. L. E. (Guaiacum-resin, (bruised, L. in coarse powder, E.), ʒiv. (ℨvij., L. E.); rectified spirit, *by measure* ℔ij. (Oij., L. E.); macerate for 7 (14, L.) days and filter). Dose, fʒi. to fℨss.; it is decomposed by water, it should be therefore suspended in aqueous vehicles by means of

sugar or mucilage.—*Tinctura Guaiaci ammoniata*, D. E. *Tinctura Guaiaci composita*, L. (Guaiacum-resin, (bruised, L., in coarse powder, E.), ℥iv. (℥vij. L. E.); aromatic spirit of ammonia (spirit of ammonia, E.), ℔iss. (Oij. L. E.); macerate for 7 (14, L.) days and filter). The best of its officinal preparations; Dose, f℥j. to f℥ij., exhibited as the preceding.—*Syrupus Guaiaci*, AUGUSTIN. (Ammoniated tincture of guaiacum, f℥ij.; mucilage; and syrup of almonds, of each, f℥i.; mix). An elegant formula; Dose, f℥i. to f℥ij.

INCOMPATIBLES.—The mineral acids; and spirit of nitric ether.

IPECACUANHÆ PULVIS COMPOSITUS, D. L. E. *Compound powder of Ipecacuanha; Dover's powder.*

PREPARATION.—"Ipecacuan, in powder; and opium (Turkey, D. hard L.), in powder, of each, ℥i. (℥i., E.); sulphate of potash, ℥i. (℥viij. E.); mix (first the sulphate of potash with the opium, then the ipecacuan, D.) intimately."

PHYSICAL PROPERTIES.—A brownish-yellow powder, with an opiate odour, and a bitter, saline, slightly acrid taste.

CHEMICAL PROPERTIES.—It is composed of one part each of powdered ipecacuanha and opium, and eight parts of powdered sulphate of potash. It is insoluble in water or in alcohol.

THERAPEUTICAL EFFECTS.—One of the most powerful and most generally employed sudorifics, possessing properties which do not belong to any of its ingredients separately. Its employment is contraindicated in cases attended with irritability of the digestive organs, or where there is cerebral disturbance. It is especially adapted for the milder forms of catarrh, coryza, acute rheumatism, and general dropsy accompanied with suppressed or diminished perspiration, particularly when the urine is albuminous.

DOSE AND MODE OF ADMINISTRATION.—Gr. v. to gr. xx., in pill or in bolus made with conserve of roses. The surface of the body should be kept warm, and as a precaution against vomiting the patient should not be permitted to drink for some time after taking the medicine. Every ten grains of Dover's powder contain one grain each of opium and ipecacuanha.—*Pilulæ Ipecacuanhæ et Opii*, E. (Compound ipecacuan powder, 3 parts; conserve of red roses, 1 part; beat them into a proper mass which is to be divided into gr. iv. pills). Dose, gr. iv. to gr. viij.

MEZEREON, D. E. MEZEREUM, L.—*Bark (of the root*, L. E.) *of Daphne Mezereum.* An indigenous shrub, belonging to the Natural family *Thymelaceæ*, and to the Linnæan class and order *Octandria Monogynia.*

BOTANICAL CHARACTERS.—Stem, woody, branching, covered with a smooth greenish-grey cuticle; Leaves, scattered, smooth, lanceolate; Flowers, pale-rose colour, highly fragrant, appearing before the leaves, in little tufts on the naked branches; Berries, scarlet.

PREPARATION.—Although the London and Edinburgh Colleges direct the bark of the root to be employed, as met with in the shops it appears to have

been removed as well from the branches. The Dublin druggists and apothecaries generally employ the whole root. The bark is collected in spring, being then most active, and dried with stove heat.

Physical Properties.—The root is generally entire, of various lengths, sometimes branching; externally it is covered with the bark which is of a brown colour, smooth, wrinkled; in the centre is the white, hard, tasteless wood, between it and the outer bark the inner bark is white and cottony; the thickness of the root varies from that of a quill to that of the little finger. The bark *(cortex mezerei)* is in pieces of various lengths, quilled, tough, and pliable; it is covered with the olive-brown, tasteless epidermis; the true bark is of a greenish-white colour, and fibrous. It has a slight, nauseous odour, the taste is at first faint, but leaves a hot acrid impression upon the tongue and fauces; in the fresh state the bark has a very acrid taste.

Chemical Properties.—The inner bark of the mezereon contains a neutral crystalline principle which has been named *daphnin*, and an acrid resin, in combination with wax, sugar, colouring matter, woody fibre, &c. It yields its active principles to water and to alcohol.

*Adulterations.*—Various similar barks and roots are either mixed with, or substituted for, mezereon; they may be distinguished by not having the same acrid taste. The woody part, which constitutes the greater portion of the root, is perfectly inert, and consequently should not be employed.

Therapeutical Effects.—Mezereon is a stimulating diaphoretic, but its properties as such are very feeble in comparison to its acridity, in consequence of which it is not much employed at present. It was formerly in high repute as an efficacious remedy for venereal nodes, and in other forms of secondary syphilis. (See *Epispastics)*.

Dose and Mode of Administration.—In decoction, in doses of f℥iv. or f℥v., three or four times a day.—*Decoctum Mezerei*, D. (Mezereon bark, ℥ij.; liquorice root, bruised, ℥ss.; water, ℔iij.; boil down to ℔ij. and strain). It also enters into the composition of the compound decoction of sarsaparilla.

Sarza, L. E. Sarsaparilla, D. *Root of Smilax sarsaparilla*, D.—*of Smilax officinalis*, L.—*and probably also of other species*, E. *Sarsaparilla*. The various species of the genus sarsaparilla, from which the medicinal root is obtained, are inhabitants of the warmest regions of South America, especially Peru and Mexico. They are placed in the Natural family *Smilaceæ*, and in the Linnæan class and order *Diœcia Hexandria*.

Botanical Characters.—Diœcious creepers; Perianth, six parted; Male flowers, with six stamens; Female, with a 3-celled ovary, each cell one seeded; Berry, 3-celled, containing one to three roundish seeds.

Preparation.—The roots are dug up the whole year round, and dried in the sun.

Physical Properties.—Several varieties of sarsaparilla are met with in English commerce; the most important of these are, Jamaica, Hon-

duras, Brazil, and Lima Sarsaparilla. They are met with in bundles formed of the folded roots, in the Brazilian variety the roots are unfolded; the bundles are generally from twenty inches to three feet in length; the roots consist of a rhizome, *the chump* of druggists (which, however, is frequently absent), and of numerous rootlets several feet in length, about the thickness of a writing pen, cylindrical, flexible, wrinkled longitudinally, with more or less root-fibres attached to them; of a reddish-yellow or brown colour externally, the inner bark being rose-coloured and more or less mealy, and the centre *(meditullium)*, woody, whitish and shining. Sarsaparilla has scarcely any odour, the taste is mucilaginous, slightly nauseous, leaving an acrid sensation on the back part of the tongue and fauces. *Jamaica Sarsaparilla*, which is most probably the produce of *Smilax officinalis*, has a lively red tint, and more attached root-fibres than the other sorts, whence it is sometimes called *red-bearded sarsaparilla*, it is the most esteemed. *Honduras Sarsaparilla* is of a grayish-brown colour, and has but few rootlets attached; the inner bark is so amylaceous, that when the root is rubbed or broken, a white mealy powder is driven out of it; this is the sort generally used in the shops for cutting into chips. *Brazilian Sarsaparilla* which is the produce of either *Smilax papyracea* or *Smilax siphilitica*, resembles the last in colour and mealiness, but is almost free from rootlets, and the *chump* is not attached. *Lima Sarsaparilla* resembles in appearance Jamaica, for which it is often sold, its colour, however, is grayish-brown, and the *chump* is invariably attached, being folded into the centre of the bundle.

Chemical Properties.—Various analyses have been made of sarsaparilla; it appears to consist of volatile oil, nearly all of which is lost by drying, of a peculiar white crystallizable principle, which has been named *smilacin (paraglin, salseparine, parallinic acid*, of various chemists), acrid bitter resin, lignin, starch, and mucilage. It yields its active properties to boiling water by simple maceration; and the continued boiling, to which it is submitted by the directions of the Colleges, for preparing the decoctions, the syrup, and the extracts, is not only perfectly useless, but highly injurious, and to this fact we may ascribe the great discrepancy of opinion which exists as to the medicinal properties of the drug.

*Adulterations.*—The roots of various allied species which do not possess any medicinal property whatsoever, are mixed in America with the true sarsaparillas; and in this country the inferior sorts are sold for the finer qualities. The former fraud may be detected by the taste, which is the surest criterion; the latter by attending to the characters of the different species as given above.

Therapeutical Effects.—Notwithstanding the little esteem that sarsaparilla is held in by many practitioners, a medicine possessing the great activity that it does in the recent state, as described by Dr. Hancock, can be scarcely inert; unless, as before observed, we destroy its medicinal properties by the pharmaceutical processes to which it is submitted. Under its use, undoubtedly, diaphoresis is frequently produced, and secondary syphilitic affections, especially nocturnal pains, ulcerations of the throat, and cutaneous eruptions have been speedily cured; these

effects, however, have been ascribed by many, and I must say with much reason, to the restricted diet to which patients are submitted while undergoing what is called an alterative course. The question of the powers of sarsaparilla in secondary syphilis is worthy of still further investigation, particularly if we consider the high price of the drug, and the great expenditure which its use in hospitals and public charities entails on these institutions; and in any future trials it would be well to use a simple infusion, prepared with boiling water in the same manner and of the same strength, as the compound infusion of the Dublin Pharmacopœia, substituting boiling distilled water for the lime water ordered in that formula.

Dose and Mode of Administration.—In powder, the dose is from ʒj. to ʒij.; it is very seldom administered in this form; but if the powder be good, as may be ascertained by the taste, it ought to prove the best mode of giving the medicine, it may be made into a bolus with honey.—*Infusum Sarsaparillæ compositum,* D. (Sarsaparilla root, previously cleansed with cold water and sliced, ʒi.; lime water, *by measure* ℔j.; macerate for 12 hours in a close vessel, shaking it occasionally and strain). Although lime water is here ordered, it is not so good a solvent for the constituents of sarsaparilla as distilled water. Dose, fʒiv. to fʒvj. two or three times a day.—*Decoctum Sarsaparillæ,* D. *Decoctum Sarzæ,* L. E. (Sarsaparilla, sliced (and cleaned with cold water, D.), ʒiv. (ʒv., L. E.); boiling (distilled, L.) water, ℔iv. (Oiv., L. E.); macerate with a medium heat (near the fire L.) for 4 (2, E.) hours in a vessel lightly covered; take out the root, bruise and replace it; (macerate for two hours further, L.) boil down to ℔ij. *by measure* (Oij., L. E.), then (squeeze, L. E.), and strain). Dose, fʒiv. to fʒviij., three or four times a day.—*Decoctum Sarsaparillæ (Sarzæ,* L. E.) *compositum,* D. L. E. (Decoction of sarsaparilla, boiling, *by measure* ℔iv. (Oiv., L. E.); sassafras chips; guaiac turnings; bruised liquorice root, of each, ʒi. (ʒx., L. E.); mezereon root bark, ʒiij. (ʒiv., E.); boil for a quarter of an hour and strain). The old *decoction of sweet-woods;* Dose, fʒiv. to fʒvj., three or four times a day.—*Extractum Sarsaparillæ,* D. *Extractum Sarzæ,* L. (Sarsaparilla, sliced, ℔j. (℔iiss., L.); boiling (distilled, L.) water, cong. j. (cong. ij., L.); macerate for 24 hours, then boil down to ℔iv. (cong. j., L.); and strain the liquor while yet hot; lastly evaporate to a proper consistence). Dose, ʒss. to ʒij.—*Extractum Sarsaparillæ fluidum,* D. (Sarsaparilla, sliced, ℔j.; water, *by measure* ℔xij.; boil together for an hour and pour off the liquor; then add ℔ij. *by measure* of water, repeat the boiling and pouring off; express strongly the liquor from the residue, set aside the mixed liquors that the feces may subside; then evaporate the mixture by continual boiling down to ʒxxx., and add ʒij. of rectified spirit).—*Extractum Sarzæ fluidum,* E. (Sarsaparilla chips, ℔j.; boiling water. Ovj.; digest the root for 2 hours in 4 pints of the water, take it out, bruise and replace it, and boil for 2 hours; filter and squeeze out the liquor; boil the residue in the remaining 2 pints of water, and filter, and squeeze out this liquor also; evaporate the united liquors to the consistence of syrup; add, when the product is cool, as much rectified spirit as will make in all, fʒxvj.—This fluid extract may be aromatized with volatile oils or

warm aromatics). Notwithstanding the introduction of the above formula into the last edition of the Edinburgh pharmacopœia, it is a very generally received opinion that the extracts are perfectly inert; by those who prescribe them, they are used as adjuncts to the decoctions. Dose, f℥ss. to f℥j.—*Syrupus Sarsaparillæ.* D. *Syrupus Sarzæ,* L. E. (Sarsaparilla sliced, ℔j. (℥xv., L. E.); boiling water, cong. j.; macerate the sarsaparilla in the water for 24 hours; then boil down to ℔iv. (Oiv., L. E.), and strain the liquor while hot; and add sugar (℥xv., L.) so as to make a syrup). Dose, f℥iv. to f℥vi., diluted with water, or as an adjunct to the decoction.

Incompatibles.—Lime water; and the acetates of lead.

Sassafras, D. L. E.—*The root, (and wood and volatile oil,* D.*) of Laurus sassafras,* D. L.—*of Sassafras officinale, E. Sassafras.* The same tree is indicated by all the Colleges, but the Edinburgh has adopted the nomenclature of Nees von Esenbeck. It is a native of North America; and belongs to the Natural family *Lauraceæ,* and to the Linnæan class and order *Enneandria Monogynia.*

Botanical Characters.—A tall straight tree; with alternate, caducous leaves, of a lucid green colour; Flowers, diœcious, yellow, appearing before the leaves; Berry succulent, of a rich blue colour.

Preparation.—The root is dug up at all periods of the year and cut into billets in which form it is imported into Britain; the volatile oil is obtained from it by distillation.

Physical Properties.—Sassafras root is imported in various sized, branched, pieces or logs, covered with a reddish-brown bark which is often partially stripped off; the wood is of a reddish-yellow colour, light and very porous; it has an aromatic agreeable odour, somewhat resembling fennel, and a warm aromatic taste. The odour and taste of the bark are stronger than of the wood. The volatile oil is of a pale yellow colour, has an analogous odour and taste, and is heavier than water.

Chemical Properties.—Sassafras wood and bark have been recently analysed by Reinsch; the latter is much the more active. It contains a peculiar principle which he has named *sassafrid,* and which bears much resemblance to tannic acid, a light and heavy volatile oil, camphoraceous matter, tannin, and other unimportant matters. The medicinal virtues are extracted both by water and alcohol.

Therapeutical Effects.—A stimulating diaphoretic, but its powers as such are so uncertain that it is never prescribed alone. The wood forms a constituent of the *compound decoction of sarsaparilla,* and of the *compound decoction of guaiacum,* but the continued boiling to which these preparations are submitted, must completely dissipate the volatile oil, the active principle of the sassafras.

Dose and Mode of Administration.—It may be given in the form of infusion, prepared by infusing ℥i. of the chips in Oi. of boiling water for an hour, of which f℥ij. may be taken three or four times a day.—*Oleum Sassafras,* D. E. (Prepared according to the general direction for volatile oils). But seldom used, it is an aromatic stimulant in doses of min. ij. to min. x.

# CHAPTER VIII.

## DIURETICS.

Diuretics are medicines which augment the secretion and promote the discharge of urine. These effects are produced in a very different manner by different substances; some acting as direct stimulants to the secreting vessels of the kidney, being taken into the current of the circulation and carried without undergoing any decomposition *in transitu* to the urinary organs; others are partially acted on by the digestive organs, and some of their component parts thus eliminated are carried by the circulation to the kidneys, which are thereby stimulated to increased action; while a third class of substances acts primarily on the stomach, the action they excite being secondarily communicated by sympathy to the urinary organs. In whatever manner the action of diuretics is produced, the general effect is to diminish the watery part of the blood, and by this means promote the absorption of fluid effused into any of the cavities or into the cellular membrane. Hence, dropsy is the disease in which they are principally employed, and when the discharge of urine can be excited by their administration, the effused fluid is in general removed more speedily from the system and with less injury to the patient than by any other method. But they are most uncertain in their operation, and it often happens that, although the discharge of urine is much augmented, the dropsical swellings are not removed. The action of diuretics is much modified by the state of the skin, and therefore it frequently occurs that if the surface of the body be excited by external warmth after the administration of a diuretic, its action will be diverted from the kidneys to the vessels of the skin, and diaphoresis will be occasioned. A cathartic action seems also to be, to a certain extent, incompatible with diuresis, and consequently some remedies, as cream of tartar, oil of turpentine, &c. which, if given in small doses properly regulated, increase remarkably the urinary discharge, when administered in larger doses so as to act on the bowels, will occasion scarcely any apparent influence on the functions of the kidneys. When any of the saline diuretics are administered, they should be given in a state of great dilution, as, if the solution in which they are prescribed be not of a lower specific gravity than the urine, it very generally fails to produce

diuresis. The most important rules to be attended to in the exhibition of the remedies of this class, are to keep the surface of the body cool, and to promote the operation of the substance by the use of diluent drinks.

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Æthereus Nitrosus spiritus, D. Spiritus Ætheris Nitrici, L. E.—*Nitrous ethereal spirit; Hyponitrous ether with (four volumes of, E.) rectified spirit; Spirit of nitric ether; Sweet spirits of nitre.*

Preparation.—*Dub.*—"Add to the residuum of the distillation of nitrous ether, the rectified spirit employed in that operation for condensing the elastic vapour, and distil to dryness with a greater heat of a water bath; mix the distilled liquor with the alkali liquor remaining after the separation of the nitrous ether, mix and add sufficient dry carbonate of potash to saturate the free acid, as indicated by litmus paper; lastly, distil with the medium heat of a water bath as long as any drops come over." The *Dublin pharmacopœia* contains also a second process, nearly similar to that of *London*, and which is more usually followed. *Dub.—Lond.*—"Add gradually ℥ij. (℥iv., L.) of nitric acid to ℔j. *by measure*, (℔iij., L.) of rectified spirit; mix and (with a gentle heat, D.) distil ℥xij. (f℥xxxij., L.)." *Edin.*—"Rectified spirit, Oij. f℥vj.; pure nitric acid (D. 1500), f℥vij.; put f℥xv. of the spirit with a little clean sand into a two-pint matrass, fitted with a cork, through which are passed a safety tube terminating an inch above the spirit, and another tube leading to a refrigeratory; the safety tube being filled with pure nitric acid, add through it gradually f℥iiiss. of the acid. When the ebullition which slowly arises is nearly over, add the rest of the acid gradually, f℥ss. at a time, waiting till the ebullition caused by each portion is nearly over before adding more, and cooling the refrigeratory with a stream of water, iced in summer. The ether thus distilled over being received into a bottle, it is to be agitated, first with a little milk of lime till it ceases to redden litmus paper, and then with half its volume of a concentrated solution of muriate of lime. The pure hyponitrous ether thus obtained, which should have a density of 899, is then to be mixed with the remainder of the spirit, or exactly four times its volume. Spirit of nitric ether ought not to be kept long, as it always undergoes decomposition, and becomes at length strongly acid."

Physical Properties.—A transparent, colourless liquid, with a peculiar fragrant, ethereal odour, and a pungent, sweetish, acidulous taste. The Sp. gr., as prepared by the process of the three British pharmacopœias varies; that of Dublin being ·850; of London, ·834; and of Edinburgh, ·847.

Chemical Properties.—This preparation is a mixture of hyponitrous ether and alcohol in variable proportions. It is very volatile producing much cold during its evaporation; is very inflammable, and burns with a whitish flame. It mixes with alcohol and water in all proportions. By keeping, it gradually becomes acid.

*Adulterations.*—Spirit of nitric ether often contains free nitrous acid probably from being too long kept. It is adulterated with water and with alcohol; the tests of the *Edinburgh Pharmacopœia*, readily detect these impurities.—"Density, ·847, (·850, D.; ·834, L.). It effervesces feebly or not at all with solution of bicarbonate of potash; when agitated

with twice its volume of concentrated solution of muriate of lime, twelve per cent of ether slowly separate."

Therapeutical Effects.—This preparation operates as a mildly stimulating diuretic, and with such intention is administered in dropsical affections especially when occurring in children. It is most generally employed as an addition to other remedies of this class, as digitalis, squill, &c.; the diuretic operation of which it renders more certain. Spirit of nitric ether sometimes fails to act on the kidneys, when it generally promotes the cuticular secretion, and consequently it is frequently employed with benefit in combination with the water of acetate of ammonia in the early stages of febrile diseases. Christison states that as a diuretic he has found sweet spirits of nitre "least serviceable in dropsy connected with diseased kidney, and most useful in the form associated with diseased heart."

Dose and Mode of Administration.—f℥ss. to f℥ij. or f℥iij. every second or third hour, it is best given in water or in camphor mixture. —*Diuretic potion,* Swediaur. (Spirit of nitric ether; and vinegar of squills, of each; f℥i.; infusion of juniper, f℥iij.; compound spirit of horseradish; and syrup of ginger, of each, f℥ij.; mix). Dose, f℥i., two or three times a day.

Incompatibles.—Sulphate of iron; alkaline and earthy carbonates; and tincture of guaiacum.

Bucku, E. Diosma, L. Diosma crenata, folia, (Buchu), D.—*Buchu or Bucku; Leaves of various species of Barosma,* E. *Leaves of Diosma crenata,* D. L. The various species of the genus Diosma, or as it has been recently named Barosma, from which the buchu of commerce is obtained, are Natives of the Cape of Good Hope; and are placed in the Natural family *Rutaceæ,* and in the Linnæan class and order *Pentandria Monogynia.*

Botanical Characters.—Small shrubs, with opposite, smooth, dotted leaves, and stalked axillary flowers; all the species have a heavy odour.

Physical Properties.—As it occurs in commerce at present, buchu consists of the leaves of *Barosma serratifolia* mixed with a small quantity of the white flowers, but a few years since, as described in the first edition of this book, it was composed of various species, two in particular *B. crenata, and B. crenulata,* intermixed with broken stalks and seed vessels. The leaves are smooth and shining, dotted with glands containing essential oil; they are of a pale yellowish-green colour, have a heavy aromatic odour resembling a mixture of rue and peppermint, and an aromatic taste leaving a sense of coldness on the mouth.

Chemical Properties.—Buchu leaves consist of volatile oil (upon which their medicinal properties chiefly depend), gum, resin, extractive, &c. They yield their virtues to water and to alcohol. The volatile oil is of a yellowish-brown colour, lighter than water, and of the same odour as the leaves; the extractive has been named *Diosmin.*

Therapeutical Effects.—Buchu is a stimulating diuretic; the volatile oil is taken into the circulation, and it communicates its odour to the urine soon after it has been taken. Independently of its stimulating the kidneys to increased action, it seems to act as a direct tonic to the mucous membrane of the urino-genital organs; thus, it is found most useful in chronic mucous discharges from the bladder and urethra, in diseased prostrate, in irritability of the bladder, and in some forms of incontinence of urine. At the Cape of Good Hope, the powdered leaves are used as a vulnerary, and a spirit distilled from them is employed in dyspeptic affections.

Dose and Mode of Administration.—In powder, (a bad form), ϑj. to ʒss.—*Infusum Buchu*, D.—*Bucku*, E.—*Diosmæ*, L. (Buchu leaves, ʒss. (ʒi. L. E.); boiling (distilled, L.) water, *by measure* ℔ss. (Oj. L. E.); infuse for four (two, E.) hours, and strain "through linen or calico," E). Dose, fʒi. to fʒij.—*Tinctura Buchu*, D. E. (Buchu leaves, ʒij. (ʒv. E.); proof spirit, *by measure* ℔i. (Oij. E.); macerate for 7 days and filter. "May be also made quickly and conveniently by percolation," E.). Dose, fʒi. to fʒiij., in any convenient vehicle.

Incompatibles.—The sesquisalts of iron; and the astringent vegetables.

Cambogia.—The diuretic properties of gamboge have been before noticed, and a formula given for its administration with that intention, (See page 73).

Cantharis, L. E. Cantharis vesicatoria, D.—*Cantharis vesicatoria; The whole fly; Cantharides.* This, the *Meloë vesicatorius* of Linnæus, belongs to the class *Insecta*, and to the order *Coleoptora*. It is a native of the middle and southern parts of Europe, and has been also met with, but rarely, in England. It frequents the ash, the privet, the lilac and the honeysuckle, and is also found on the elder, the rose, the plum, the elm and the poplar, upon the leaves of which trees the insect feeds. In the month of June, Cantharides are collected in the South of Europe. In the morning before the rising of the sun while the insects are still torpid from the moisture of the night, men, whose faces and hands are covered with masks and gloves, having spread a cloth upon the ground, shake the trees violently; the insects fall into the cloth, are immediately gathered in sieves, and are killed by exposure to the vapour of vinegar or preferably by being placed for a short time in an air-tight vessel; they are then dried in stoves. When perfectly dry, cantharides are immediately put into air tight boxes, containing a little sulphate of lime or camphor, the former to keep them dry, and the latter to preserve them from the attacks of mites and other insects by which they are devoured.

Physical Properties.—Each cantharis is from six to ten lines long, and about a grain and a half in weight; it has two wing-covers or elytræ, long, flexible, of a golden-green colour; two membranous, transparent wings, inferior, folded; antennæ, black, filiform, longer than the head;

and a longitudinal furrow along the head and neck. Cantharides have a faint disagreeable odour, and a resinous, very acrid taste. They are readily reduced to powder, which in the finest state presents numberless glistening green particles of the elytræ; this is their most distinguishing characteristic, Orfila having recognized them in the human stomach nine months after interment.

Chemical Properties.—Cantharides consist of a white crystalline substance named *cantharidine*, of a yellow fat oil, a concrete green oil, a yellow viscid substance, a black substance, osmazome, uric, acetic, and phosphoric acids, and some salts. Its active properties are due to the cantharidine, which may be obtained by acting on the powder with rectified spirit, distilling off the spirit and crystallizing; it occurs in the form of white, micaceous scales, is very volatile even at the ordinary temperature, is very soluble in alcohol, ether and the fixed and volatile oils, but when pure is insoluble in water. It is a very active poison and produces immediate inflammation of the skin wherever it comes in contact with it.

*Adulterations.*—By the characters given above, cantharides may be distinguished from other insects which resemble them, and are said to be frequently mixed with them on the Continent. They are best protected from the attacks of mites, which destroy their activity, by keeping in well-stoppered bottles and adding a few drops of strong acetic acid (Pereira), or a few grains of camphor which I have found very effectual. In powder they are said to be adulterated with euphorbium, a fraud not easily detected.

Therapeutical Effects.—The most important medicinal property of the Spanish fly, is its vesicating power, which will be considered hereafter, (See *Epispastics*). In large doses it is a powerful irritant poison; in small or medicinal doses, it acts as a stimulant to the urino-genital organs, generally causing diuresis and exciting the venereal appetite; but according to Christison, the latter effect is not produced unless it be taken in poisonous doses. As a diuretic, cantharides are not much used in consequence of the dangerous symptoms which sometimes arise even from small doses; those who have employed them, state that they prove beneficial in incontinence of urine caused by paralysis of the neck of the bladder, and when it occurs in young persons during sleep. They have also been highly praised by many as a remedy for gleet, leucorrhœa, and chronic mucous discharges from the urinary organs.

Dose and Mode of Administration.—Cantharides are seldom employed internally in the form of powder, the dose is gr. ss. to gr. ij. made into pill with extract of liquorice or conserve of roses.—*Tinctura Cantharidis*, D. L. E. (Cantharides, (in powder, D. bruised, L.), ʒij. (ʒss. L. E.); proof spirit, *by measure* ℔iss. (Oij., L. E.); digest for 7 (14, L.) days, strain (express strongly the residuum and filter the liquor, E.) "This tincture may be obtained more conveniently and expeditiously by percolation, provided the cantharides be reduced to coarse powder, and left with a little of the spirit in the state of pulp for 12 hours before the process of percolation is commenced," E.). Dose, min. x. gradually increased to min. xl.; it should be given in an ounce at least of some emulsion, or of decoction of linseed or barley.

In cases of poisoning with cantharides, we are not acquainted with

any antidote; but emetics, emollient and mucilaginous drinks, bloodletting general and local, opiates by the mouth and rectum, and general antiphlogistic treatment, should be resorted to.

DIGITALIS PURPUREA, FOLIA, D. DIGITALIS FOLIA ET SEMINA, L. DIGITALIS, E.—*The leaves (and seeds, L.) of Digitalis purpurea. Foxglove.* An indigenous, biennial herb; belonging to the Natural family *Scrophulariaceæ,* and to the Linnæan class and order *Didynamia Angiospermia.*

BOTANICAL CHARACTERS.—Stem erect, three to four feet high, with a purplish hue; Leaves, large, veiny, ovato-lanceolate, crenate, downy, purplish on their under surface; Flowers, numerous, purple, spotted within, drooping, in very long spikes.

PREPARATION.—The leaves are gathered in the months of June and July, just before the plant comes into flower, and the mid-rib and stalk removed; they are dried with stove heat, in a dark place. The seeds are gathered when fully ripe, they are very seldom employed.

PHYSICAL PROPERTIES.—The dried leaves of digitalis when properly preserved, are of a bright green colour, they have scarcely any odour, but the taste is nauseous and acrid.

CHEMICAL PROPERTIES.—They consist of volatile oil, a concrete flocculent volatile matter, fatty matter, extractive, tannin, &c., and a peculiar principle recently discovered by M. M. Homolle and Quevenne and named by them *digitaline,* which will be described in the chapter on *Sedatives.* The leaves yield their active properties to water, alcohol, ether, and the weak acids. The sesqui-salts of iron produce a dark, and solution of gelatin a white flaky precipitate with infusion of digitalis, indicating the presence of tannin.

*Adulterations.*—The leaves of several species of Verbascum are often offered for sale for those of digitalis; the botanical characters should be therefore attended to. The powder should be of a fine green colour, and possess the acrid taste of the fresh plant.

THERAPEUTICAL EFFECTS.—Digitalis, in small doses gradually augmented, operates as a special stimulant to the kidneys, increasing the secretion of urine; in somewhat larger doses, or when its use is continued for a longer period, it acts as a *sedative* to the vascular system, (See *Sedatives*). As a diuretic in the various forms of dropsy, digitalis has acquired a high reputation, but later experience has shown, that it proves most serviceable in those symptomatic dropsical effusions, which take place into the cellular membrane of the extremities and of the face, and which depend on diseases of the heart, of the kidneys, or of the liver. It is also better adapted as a diuretic for persons of a weak or enfeebled habit of body, than for the strong or the robust; and should any inflammatory symptoms be present, antiphlogistic treatment should be had recourse to before employing digitalis. The diuretic action of foxglove is much promoted by combining it with small doses of calomel, or with other remedies of this class, as squill, juniper, the diuretic salts of potash,

&c.; when there is much debility present, preparations of iron are advantageously combined with it.

Dose and Mode of Administration.—Of the powder gr. ss. every six hours, its operation being aided by the use of diluents, and the surface of the body being kept cool; administered thus, it generally produces a copious flow of urine after the fifth or sixth dose.—*Infusum Digitalis*, D. L. E. (Digitalis, dried, ʒi. (ʒij. E.); spirit of cinnamon, ℥ss. (fʒi. L. fʒij. E); boiling (distilled, L.) water, *by measure* Ibss. (Oi. L. fʒxviij. E.); digest for 4 hours in a covered vessel, strain (through linen or calico, E.), and add the spirit). This is the best preparation of digitalis; the dose is fʒij. to fʒss., every six hours.—*Tinctura Digitalis*, D. L. E. (Digitalis, dried (and coarsely powdered, the larger leaves being rejected, D., in moderately fine powder, E.), ʒij. (ʒiv. L. E.); proof spirit, *by measure* Ibj. (Oij. L. E.); macerate for 7 (14, L.) days and strain. "Best prepared by percolation, as directed for tincture of capsicum; if fʒxl. of spirit be passed through, the density is ·944, and the solid contents of a fluid ounce amount to gr. xxiv." E.). This tincture if well prepared, has a greenish colour when viewed by transmitted light. Dose, min. xx., three times a day; it may be given in fʒi. of decoction of broom-tops, combined with sweet spirits of nitre, and compound spirit of juniper.—*Pilulæ Digitalis et Scillæ*, E. (Digitalis; and squill, of each, one part; aromatic electuary, two parts; beat into a proper mass with conserve of red roses, and divide into four-grain pills). An excellent diuretic pill; Dose, one pill every five or six hours.

Incompatibles.—Sulphate, and tincture of the muriate, of iron; the preparations of cinchona bark; and the acetates of lead.

Juniperus communis, cacumina, fructus (baccæ, D.), et oleum, D. L. E.—*The tops, the fruit, and the volatile oil of the fruit, of Juniperus communis; Common Juniper.* Indigenous; belonging to the Natural family *Coniferæ (Pinaceæ*, Lindley), and to the Linnæan class and order *Diœcia Polyandria.*

Botanical Characters.—A bushy shrub from two to eight feet high, evergreen; Leaves, linear, mucronate; Flowers appearing in May, axillary, small; Fruit, a berry *(galbulus)*, three-seeded, requiring two seasons to arrive at maturity.

Preparation.—The tops are cut in spring before the plant flowers, and the berries are gathered when ripe, both are dried with stove heat; the oil is obtained from the berries by simple distillation.

Physical Properties.—*Juniper berries* are spherical, somewhat larger than a pea, of a bluish-black colour; they have a strong aromatic, terebinthinate odour, and a sweetish, pungent, terebinthinate taste. They are imported from Hamburgh and from several of the Mediterranean ports.—*Juniper tops* have a similar odour and taste but much weaker.—*Juniper oil* is limpid, transparent, lighter than water, and of a very pale greenish colour. It has the peculiar odour and taste of the berries in a marked degree. Its composition is $C^{10}$ $H^8$ being isomeric with oil of turpentine, and its sp. gr. ·911.

Chemical Properties.—The medical properties of juniper are due to the volatile oil; the berries contain besides, resin, sugar, gum, wax, and some salts of lime. The tops and berries yield their active principles to boiling water and to alcohol.

Therapeutical Effects.—Juniper is a stimulating diuretic, promoting the secretion of urine to which it communicates its peculiar odour. It is chiefly used as an adjunct to other diuretics in dropsical affections; its use is contraindicated if the kidney be diseased, or if any inflammatory symptoms be present.

Dose and Mode of Administration.—The berries may be given in the form of infusion, prepared by infusing for an hour in a covered vessel, ʒj. of the bruised berries in fʒxx. of boiling water; Dose, fʒiv. three or four times a day; the tops are at present scarcely ever employed; the oil may be given rubbed up with sugar or in some spirituous vehicle, in doses of min. v. to min. x. It is to the presence of this oil that the spirit called *Geneva or Hollands* owes its peculiar flavour and the diuretic properties it possesses.—*Spiritus Juniperi compositus*, D. L. E. (Juniper berries, bruised, ℔j. (ʒxv. L.); caraway, bruised; and fennel, bruised, of each, ʒiss. (ʒij. L.); proof spirit, cong. j. (Ovij. E.); water sufficient to prevent empyreuma (Oij. L. E.); macerate for 24 (48, E.) hours, add the water, and distil a gallon (Ovij. E.), "mix, and distil a gallon with a slow fire," L.). A powerful diuretic, introduced into the pharmacopœias as a substitute for *Geneva*. Dose, fʒij. to fʒiv. Generally used as an adjunct to stimulating diuretic mixtures.

Pareira, L. E. *Root of Cissampelos Pareira; Pareira-brava.* This plant is an inhabitant of the West Indian isles and of the South American Main; it belongs to the Natural family *Menispermaceæ*, and to the Linnæan class and order *Diœcia Monadelphia*.

Botanical Characters.—A climbing shrub, with a woody branching root; leaves, smooth, silky beneath; Flowers, small, yellow; Berries, scarlet, roundish, hispid.

Physical Properties.—Pareira root is imported in cylindrical pieces, from half an inch to three inches in diameter, and from five or six inches to three or four feet in length. It is covered externally with a dark-brown cortex, which is thin and firmly adherent; internally the wood is very porous, of a pale reddish-yellow colour. It is odourless, but has a sweetish, aromatic, intensely bitter taste.

Chemical Properties.—It consists of a soft resin, bitter extractive *(cissampelin)* on which its activity depends, fecula, nitrate of potash and other salts, colouring matter, lignin, &c. It yields its virtues to both cold and boiling water.

Therapeutical Effects.—Pareira is a tonic diuretic, acting specifically on the urinary organs, increasing their secretion, and at the same time checking discharges from the mucous membrane of the bladder and urethra. It is with the latter intention only, that it is ever employed

at present; and according to the observations of Sir Benjamin Brodie, it has a great influence over the ropy mucous discharge of chronic inflammation of the bladder.

Dose and Mode of Administration.—In powder, a bad form, ʒss. to ʒi.—*Extractum Pareiræ*, L. E. ("Pareira, bruised, ℔iiss.; boiling distilled water, cong. ij.; macerate for 24 hours, then boil down to cong. j. and strain the liquor while yet hot; lastly evaporate to a proper consistence," L. "Prepared as extract of Gentian," E.). Dose, gr. x. to ʒss., generally given as an adjunct to the infusion.—*Infusum Pareiræ*, L. E. (Pareira, ʒvi.; boiling (distilled, L.) water, Oj.; macerate for two hours in a lightly covered vessel and strain, "through linen or calico," E.). Much too weak a preparation, the quantity of root employed might be doubled with advantage. Dose, fʒj. to fʒiv., three or four times a day. Christison recommends the infusion to be prepared with cold water and by the process of percolation, but boiling water more completely extracts the bitter principle.—*Decoctum Pareiræ*, Brodie. (Pareira, ʒss.; boiling water, Oiij.; boil down to Oj., with a gentle heat). Dose, fʒj. to fʒiij., three or four times a day. This is the preparation in most general use.

Incompatibles.—The sequi-salts of iron; the acetates of lead; and tincture of iodine.

Potassæ acetas. *Acetate of Potash* (described in the division *Cathartics*), dissolved in a large quantity of water and given in small doses frequently repeated, operates as a mild but certain diuretic. It is employed most generally as an adjunct to other remedies of this class, in ascites and hydrothorax. Dose, as a diuretic, gr. x. to gr. xx., it is best administered in decoction of broom tops, or of Pyrola.

Potassæ bitartras. *Bitartrate of Potash* (described in the division *Cathartics*), when administered in small doses dissolved in a large quantity of water, or in combination with other diuretics, increases the secretion of urine remarkably, and consequently is very generally employed in all forms of dropsy. Dose, as a diuretic, gr. xx. to ʒj., frequently repeated.—*Imperial*, an excellent diuretic and refrigerant drink in febrile diseases, is prepared by dissolving ʒi. or ʒij., of bitartrate of potash in Oj. of boiling water, and flavouring with lemon peel and sugar.—*Cream of tartar whey* used for the same purposes, is prepared by boiling ʒiss. of the bitartrate in Oj., of new milk, and straining to remove the curd. Either of these drinks may be taken *ad libitum*.

Potassæ nitras, D. L. E. *Nitrate of Potash; Nitre; Saltpetre; Sal-prunelle.*

Preparation.—Nitrate of potash is an article of the Materia Medica; it is imported into Britain chiefly from the East Indies, where it is obtained by

lixiviating the surface of the soil of certain districts, dissolving out with water the saline matters contained therein, filtering and crystallizing; after importation the salt is purified by solution and recrystallization. The *Dublin College* directs the commercial salt to be further purified, "by dissolving in two parts of boiling water, filtering and crystallizing," when it constitutes the *Potassæ nitras purificatum.*

Physical Properties.—A solid colourless salt, in striated prismatic crystals generally six-sided, with dihedral summits, semitransparent, inodorous, having a cooling, saline, slightly bitter taste. Sp. gr. 1·933.

Chemical Properties.—It is composed of one eq. of potassa, and one of nitric acid, (KO, $NO^5$), is anhydrous, permanent in the air, fusible by a heat below redness into a limpid liquid, in which state, when cast in moulds, it forms *sal-prunelle;* by a strong heat it is decomposed into oxygen, and hyponitrite of potash. Nitre is soluble in four parts of water at 60°, and in about half its weight of boiling water; during the solution cold is generated; it is insoluble in absolute alcohol.

*Adulterations.*—Nitrate of potash as met with in commerce, is often contaminated with sulphate or muriate of potash; the presence of the former is detected by solution of muriate or nitrate of baryta, that of the latter, by solution of nitrate of silver, causing white precipitates, in a solution of the salt in distilled water.

Therapeutical Effects.—In large doses, from ʒvi. to ʒij., nitre acts as an irritant to the gastro-intestinal mucous membrane, producing sometimes nausea, vomiting, purging, and even death. In small doses, gr. xxx. to gr. xl., it increases the flow of urine, in which secretion it can be detected soon after it has been swallowed. It is generally employed as an adjunct to the vegetable diuretics in anasarca and ascites, but it is inadmissible in cases where there is any tendency to irritation or inflammation of the digestive tube. Nitrate of potash is greatly inferior as a diuretic to the acetate or bitartrate, and consequently in the present day, is more employed for its refrigerant properties. (See *Refrigerants).*

Incompatibles.—Sulphuric acid; alum; sulphate of magnesia; metallic sulphates; and muriatic acid if heat be applied.

Pyrola umbellata, herba, D. Pyrola, E. Chimaphila, L. *Herb of Chimaphila umbellata,* E.—*of Chimaphila corymbosa,* L.—*of Pyrola umbellata,* D.—*Winter-green; Pyrola; Pipsissewa.* This plant is a native of North America, but is also found in the woods of Europe and Asia. It belongs to the Natural family *Pyrolaceæ,* and to the Linnæan class and order *Decandria Monogynia.*

Botanical Characters.—A small perennial under-shrub; with evergreen, cuneato-lanceolate leaves, coriaceous, smooth and shining; Flowers in a small corymb, reddish-white, fragrant.

Physical Properties.—Although the entire herb is indicated by the colleges, the leaves only are generally employed. In the fresh state when

bruised they have a strong unpleasant smell, but in the dry state they are odourless; they have a bitter-sweet, astringent, slightly aromatic taste. If applied to the skin when recently gathered, they act as slight vesicatories.

Chemical Properties.—They contain, bitter extractive, resin, tannin, &c.; the medicinal virtues probably depend on the combination of these three substances, they are communicated to boiling water by infusion, but more completely by decoction.

Therapeutical Effects.—Pyrola leaves operate as a tonic diuretic, exerting a specific influence on the urinary organs, increasing the secretion of urine, and according to many observers diminishing the secretion of lithates. They have been chiefly used in dropsies occurring in the old and debilitated, and in chronic mucous discharges from the bladder and urethra. In the advanced stages of *albuminuria* where diuretics are sometimes called for, I have administered the decoction of this herb with excellent effect.

Dose and Mode of Administration.—Never given in powder.—*Decoctum Pyrolæ*, D.—*Chimaphilæ*, L. (Pyrola, ℥i.; water, (distilled L.), *by measure* ℔ij. (Oiss., L.); "macerate for six hours, take out the pyrola, bruise, and replace it; boil down to ℔j. *by measure*, and strain," D.—"boil down to a pint and strain," L.). Dose, f℥i. to f℥ij. three or four times a day.—An extract may be prepared by evaporating the decoction to a proper consistence; it is not used in this country, but is much employed in America in doses of gr. v. to gr. xv.

Incompatibles.—The sesqui-salts of iron; and all substances incompatible with tannin.

Scilla, L. E. Scilla maritima, bulbus, D. *The bulb of Scilla maritima*, D. L.—*of Squilla maritima*, E. (*Urginea maritima*, Steinheil). *Squill.* A native of the shores of the Mediterranean, of France, and of Portugal; belonging to the Natural family *Liliaceæ*, and to the Linnæan class and order *Hexandria Monogynia*.

Botanical Characters.—Bulb, very large, sending up annually a scape or flowering stem from two to three feet high, terminated by a dense long raceme of white flowers; the leaves, which appear after the flowers, are broadly lanceolate, 12 to 18 inches long.

Preparation..—The bulb, which is the officinal part of the plant, is dug up in autumn, divided into four parts, the centre cut out and rejected as being inert, and the remainder cut into thin slices, which are dried quickly with a gentle heat. Sometimes, however, the bulb is imported entire. Squill is brought from Malta, and other Mediterranean ports; also from St. Petersburgh and Copenhagen

Physical Properties.—The entire bulb varies in size from that of the fist to that of a child's head, ovoid, covered externally with layers of thin, reddish *(squilla rubra)*, or whitish *(squilla alba)*, papery membranes; internally, it is composed of thick, fleshy, concentric scales, of a pale rose-colour. Dried squill is in yellowish, somewhat translucent slices, brittle, but readily attracting moisture, when they become flexible; it is odourless, but has an acrid, very nauseous taste.

Chemical Properties.—Squill consists of a crystallizable alkaloid *Scillitina* probably the active principle of the drug, of tannin, gum, uncrystallizable sugar, acrid volatile matter, and some salts. It yields its virtues to water, alcohol, vinegar, and the dilute acids. The sesqui-salts of iron communicate a deep blue colour to the infusion, but it is not affected by gelatin, or by tincture of iodine.

Therapeutical Effects.—In large doses squill acts as a narcotico-acrid poison, twenty-four grains of the powder having proved fatal. In medicinal doses it operates as an emetic, expectorant, and diuretic; for the latter purpose it is usually given in combination with digitalis and calomel, when it seldom fails to produce increased flow of urine, and at the same time promote the absorption of the effused fluid in dropsies. Squill is better adapted for local than for general dropsy, it is generally held to be inadmissible, when inflammatory symptoms are present. (See *Emetics* and *Expectorants).*

Dose and Mode of Administration.—As a *diuretic.—Pulvis Scillæ,* D. (Having removed the membranous integuments, cut the bulb of squill transversely into slices, dry with an inferior heat, reduce to powder, and keep in glass bottles with ground stoppers). Dose, gr. j. to gr. iij., usually given in the form of pill made with conserve of roses or some soft extract.—*Tinctura Scillæ,* D. L. E. (Squill, (in coarse powder, E.), ʒiv. (ʒv., L. E.); proof spirit, *by measure* ℔ij. (Oij., L. E.); macerate for 7 (14, L.) days, "let the sediment settle and pour off the clear liquor," D. "strain," L.; "prepare by percolation as for tincture of cinchona, but without packing the pulp firmly in the percolator; it may likewise be prepared by digestion with the sliced bulb," E.). Dose, min. x. to min. xxx, An excellent addition to infusion of digitalis, or decoction of broom-tops.—*Acetum Scillæ,* D. L. E. (Squill, fresh dried (and in small fragments, E.), ℔ss. (ʒxv., L. ʒv., E.); distilled vinegar, *by measure* ℔iij. (Ovj., L. Oij., E.); rectified (proof, L. E.) spirit, *by measure* ʒiv. (Oss., L. fʒiij., E.); macerate the squill (with a gentle heat, L.) with the vinegar for 7 days (24 hours, L.) in a covered glass vessel, (shaking frequently, D.); express the liquor, and as soon as the feces have subsided, pour off and add the spirit). Dose, fʒss. to fʒiss. in some aromatic or distilled water.—*Vinum Scillæ,* P. (Squill, 30 parts; white wine, 500 parts; macerate for 15 days, and filter). Dose, fʒj. to fʒiij.

Incompatibles.—The alkalies; and the sesqui-salts of iron.

Scoparium, E. Scoparius, L. Spartium scoparium, cacumina, D. *The (fresh,* L.*) tops of Cytisus scoparius,* L. E.—*of Spartium scoparium, D. Broom tops.* The common-broom is an indigenous shrub; belonging to the Natural family *Leguminosæ (Fabaceæ,* Lindley), and to the Linnæan class and order *Diadelphia Decandria.*

Botanical Characters.—A bushy shrub from three to six feet high; with long, straight, green branches; and large, bright yellow, papilionaceous flowers.

Physical Properties.—The fresh green tops, the only officinal part,

have a peculiar odour when bruised, and a bitter somewhat nauseous taste.

Chemical Properties.—Broom-tops have not been analysed, their medicinal virtues appear to depend on bitter extractive and carbonate of potash, which are extracted by boiling water.

Therapeutical Effects.—In the form of infusion or decoction, broom-tops are an excellent and certain diuretic, seldom failing to produce a copious secretion of urine. The officinal preparations of broom-tops are most generally employed as vehicles for the more active remedies of this class in dropsical effusions.

Dose and Mode of Administration.—*Infusum Scoparii*, L. (Broom-tops, ℥i.; boiling distilled water, Oj.; macerate for four hours in a vessel lightly covered and strain). Dose, f℥i. to f℥ij. A bad preparation, much inferior to the decoction.—*Decoctum Scoparii*, E. (Broom-tops; and juniper tops, of each, ℥ss.; bitartrate of potash, ℥iij.; water, Oiss; boil down to a pint and strain). *Decoctum Scoparii compositum*, L. (Broom-tops; juniper berries; and dandelion, of each, ℥ss.; distilled water, Oiss.; boil down to a pint and strain). Excellent diuretics, particularly the former, which scarcely ever fails to act on the kidneys. Dose, f℥i. to f℥iv. three or four times a day.—*Extractum Spartii Scoparii*, D. (Prepared as the simpler extracts); seldom used; Dose, gr. x. to ℥ss. two or three times a day.

### Sodæ acetas, D. L.—*Acetate of Soda.*

Preparation.—*Dub.*—"Carbonate of soda, any quantity; distilled vinegar sufficient to saturate the alkali; evaporate the filtered liquor to the density of 1276; crystallize by cooling, dry cautiously and keep the crystals in a close vessel." An article of the Materia Medica of the London Pharmacopœia.

Physical Properties.—In white, striated, prismatic crystals, of the oblique rhombic series. It has a faint acetous odour when moistened, and a sharp, cooling, saline taste.

Chemical Properties.—It consists of one eq. of soda, one of acetic acid, and six of water of crystallization, (Na O, $C^4H^3O^3$, + 6 HO). It is unalterable in ordinary states of the air, but in dry warm air, effloresces slightly; it is soluble in three parts of water at 60°, and in somewhat less than its own weight of boiling water; it is also soluble in five times its weight of alcohol. Exposed to heat it undergoes the watery fusion, loses all its water of crystallization at the heat of 550°, and at a heat of 600° it is decomposed.

Therapeutical Effects.—A mild diuretic, similar in operation to acetate of potash, over which it does not possess any advantage, and for which it may be substituted. It is very rarely used in the present day.

Dose and Mode of Administration, and Incompatibles.—Same as acetate of potash.

Sodæ biboras. *Borax* (described in the division *Astringents*), is an excellent diuretic in cases of uric acid gravel, as a solution of it dis-

solves that acid freely, and does not produce any injurious constitutional effect, even when its use has been continued for some time. It should not be administered to pregnant females, as it stimulates the uterus and has in some instances caused abortion.

Terebinthinæ oleum. *Oil of turpentine* (described in the division *Anthelmintics)*, given in small doses frequently repeated acts as a stimulant to the renal vessels, causing an increased flow of urine to which it communicates a violet odour. It also possesses a specific action over the mucous membrane of the bladder and urethra, checking excessive discharges, and giving increased tonicity to the vessels which secrete the mucus. If the use of oil of turpentine be too long continued, it is apt to produce strangury, bloody urine, and even sometimes total suppression of the secretion. The dose of oil of turpentine as a diuretic is from min. x. to min xxx. It has occasionally proved serviceable in dropsical effusions, but its stimulating property forbids its employment if there be any tendency to inflammatory action. It is frequently employed with much benefit in gleet, in leucorrhœa, and in chronic cystirrhœa. Under the use of oil of turpentine, the quantity of lithic acid in the urine is much increased, owing to which it frequently proves very beneficial in chronic rheumatism and in sciatica, occurring in the old and debilitated.

Terebinthina chia, D. L. E. *Liquid resin of Pistacia terebinthus. Chian turpentine; Scio turpentine.* This tree is a native of parts of the South of Europe, of the Grecian Archipelago, and of Syria; it belongs to the Natural family *Anacardiaceæ*, and to the Linnæan class and order *Diœcia Pentandria.*

Botanical Characters.—Stem, 30 to 35 feet high; Leaves, pinnate, young leaves reddish; Flowers in compound racemes; Fruit, globular, purplish, inclosing an osseous, one-seeded nut.

Preparation.—The liquid resinous exudation, which constitutes the Chian turpentine of commerce is obtained, chiefly in the island of Scio, by making incisions into the trunk of the tree, and allowing the juice which flows out to harden on large flat stones placed under the trees; each tree yields from 8 to 10 ounces only.

Physical Properties.—It is of the consistence of very thick honey, but often nearly solid; of a pale greenish-yellow colour; has a weak terebinthinate, somewhat fragrant odour, and a slightly bitter taste.

Chemical Properties.—Chian turpentine consists of volatile oil, and resin; it resinifies by keeping, or by exposure to the air when it loses its fragrancy. This turpentine is very scarce, Strasburgh or Venice turpentine being usually substituted for it.

Therapeutical Effects.—It resembles oil of turpentine, in its action on the urinary organs; but by many it is supposed to act more effectually in checking chronic mucous discharges.

Dose and Mode of Administration.—Gr. x. to gr. xxx. three or four times a day; it may be made into pills with powdered liquorice root, or gum arabic, or it may be given in emulsion with yolk of egg or mucilage.

Terebinthina Canadensis, L. Balsamum Canadense, D. E. *Canada-balsam; Liquid resin of Pinus balsamea,* D. L.—*of Abies balsamea,* E. A native of the coldest regions of North America; belonging to the Natural family *Coniferæ (Pinaceæ,* Lindley), and to the Linnæan class and order *Monœcia Monadelphia.*

Botanical Characters.—An elegant tree; Stem about 40 feet high; Leaves, solitary, flat, sub-erect above; Cones, erect on the branches, large, nearly cylindrical, of a beautiful, deep glossy purple colour, fragrant as well as the leaves.

Preparation.—The resinous exudation improperly termed balsam is obtained either from little vesicles which form on the bark, or by making incisions quite through the bark into the wood, and collecting the juice as it exudes.

Physical Properties.—When fresh it is of the consistence of honey, but it gradually concretes into a yellow, translucent, resinous looking mass; of a peculiar agreeable, terebinthinate odour, and an acrid, rather nauseous taste.

Chemical Properties.—It consists of volatile oil, two resins one soluble the other insoluble in alcohol, extractive, and some salts. It is insoluble in water, but forms an emulsion with it by means of mucilage or yolk of egg.

Therapeutical Effects.—The action of Canada turpentine on the urinary organs is similar to that of the other turpentines; it is more generally preferred for the treatment of the advanced stages of gonorrhœa, of gleet, of leucorrhœa, and of cystirrhœa, in which diseases it proves highly beneficial.

Dose and Mode of Administration.—Similar to the last.

Urea. *A peculiar principle contained in the urine of many animals.*

Preparation.—By evaporating fresh human urine to the consistence of a syrup, treating with nitric acid, washing well with distilled water the nitrate of urea, decomposing with carbonate of potassa, dissolving the precipitated urea in alcohol and crystallizing. By the following elegant process of Liebig, ℥iv. of perfectly colourless, crystallized urea may be procured from ℔j. of ferrocyanate of potash:—"Mix together 28 parts of perfectly dry ferrocyanate of potash, with 14 of oxide of manganese, both in fine powder; place the mixture upon a smooth iron plate, and expose it to a dull red heat over a charcoal fire. By and by it will begin to burn of itself, when it is to be frequently stirred about. After it cools it is to be lixiviated with cold water. The solution is to be treated with 20½ parts of dry sulphate of ammonia, whereupon a copious deposit of sulphate of potash will ensue. It is then to be allowed to stand for some time in a warm place (under 212° F.), so as to concentrate the supernatant liquor, which is afterwards to be decanted, treated with alcohol of a density of ·835 to ·865, and crystallized."

Physical Properties.—It occurs in long, colourless, transparent crystals, which are flattened four-sided prisms. They are heavier than water, have a cooling sharp taste, but are inodorous.

Chemical Properties.—It consists of two equivalents of carbon, two of oxygen, four of hydrogen and two of nitrogen ($C^2O^2H^4N^2$). It is soluble in its own weight of water at 60°, in 4 or 5 parts of cold alcohol, and in 2 parts of boiling alcohol. It is unalterable in dry air, but deliquesces in damp air; it fuses at 248°, and is decomposed at a higher temperature. It is a feeble base combining with most acids without neutralizing them.

Therapeutical Effects.—Urea is at present scarcely ever employed as a diuretic, although from the reports of several French practitioners, it appears to promote remarkably the secretion of urine, without producing any general disturbance of the animal economy.

Dose and Mode of Administration.—Gr. x. to gr. xx. dissolved in sweetened distilled water. It may be also given made into pill or bolus, with any soft extract, or with honey, or treacle.

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# CHAPTER IX.

## EMETICS.

### (Vomits).

Emetics are substances which are used for the purpose of producing vomiting. The number of medicines employed with this intention is but few, and they act either *specifically,* that is they excite vomiting when injected into the veins, as well as when introduced into the stomach, or their operation is *topical,* producing vomiting only when taken into the stomach. Tartar emetic is an example of a *specific,* mustard of a *topical* emetic. It would be out of place here to enter into any consideration of the phenomena and pathology of vomiting; it must suffice to say, that independent of the mere evacuation of the contents of the stomach, emetics in general influence sympathetically the entire system. In prescribing emetics, attention must be paid to the differences which exist in their mode of operation; some medicines of this class as sulphate of zinc and sulphate of copper produce their effects very rapidly, exciting vomiting almost immediately after they are swallowed, without occasioning much nausea or depression. Tartar emetic operates more slowly, and produces great nausea, accompanied with a feeling of feebleness and

exhaustion. While the vegetable emetics as ipecacuanha and squill require a much longer time for their operation. In selecting a particular remedy of this class, therefore, we should be always guided by the nature of the indication which is to be fulfilled. Emetics should be employed with great caution, where there are symptoms of determination of blood to the cerebral organs, in consequence of the obstruction of the circulation which is occasioned during the act of vomiting; for the same reason also they ought not to be administered in diseases of the larger arteries as in aneurism. From the violent action of the abdominal muscles which is caused, the act of vomiting is attended with great risk in the advanced stages of pregnancy, in hernia, and in prolapsus uteri.

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Ammoniæ carbonas. *Sesquicarbonate of ammonia* (described in the division *Antacids*), given in doses of gr. xxx. or upwards, acts as a stimulating emetic, without producing much nausea or depression. It is consequently employed in cases of great debility when the use of an emetic is indicated; as in chronic bronchitis occurring in broken down constitutions, and in the suffocative catarrh of typhus. But in consequence of the uncertainty of its operation, mustard is generally preferred in these cases.

Antimonii et potassæ tartras. *Tartar emetic* (described in the division *Diaphoretics)*, administered in doses of two or three grains dissolved in water, operates as a powerful emetic, producing at the same time general depression, and much nausea. The act of vomiting does not occur for from twenty minutes to half an hour after the emetic has been taken, but it is then usually energetic and frequently repeated. The emetic action of tartar emetic is *specific*, as it operates, not only when introduced into the stomach or rectum, but when injected into the veins, or otherwise introduced into the vascular system. It is employed as an emetic in all cases, in which we wish to produce a powerful impression on the system, and at the same time lower the circulation; as in the early stages of febrile or inflammatory diseases, when, if given at the very commencement of the symptoms, the disease is frequently cut short; with this view it is employed in common continued fever, in acute ophthalmia, in croup, in hooping cough, in hernia humoralis, in bubo, &c. In cases of threatened suffocation from the lodgment of solid bodies in the œsophagus, tartar emetic has been successfully injected into the veins to produce vomiting and the expulsion of the substance. In cases of poisoning, it is inferior to other remedies of this class, in consequence of the slowness of its operation and its depressing effects. Tartar emetic is also frequently administered with the intention

of producing nausea without causing vomiting; with this view it is used in cases of strangulated hernia, to cause relaxation of the parts and permit the return of the contents of the sac, in rigidity of the os uteri obstructing labour, in dislocation to relax the muscular system, and in spasmodic stricture. It is best administered in distilled water; gr. ij. may be dissolved in f℥viij. of water, and of this f℥ij. should be administered every ten minutes until vomiting is produced, or f℥i. every quarter of an hour if it is wished to produce nausea merely. It is sometimes given in the form of enema; for this purpose gr. vj. are to be dissolved in Oj. of tepid water; in this form, however, its operation is uncertain. For injection into the veins, gr. ij. or gr. iij. are dissolved in f℥ij. of tepid distilled water.

Cupri sulphas. *Sulphate of Copper* (described in the division *Astringents*), in doses of from gr. xij. to gr. xv. operates as a speedy and effectual emetic, producing generally a single but complete evacuation of the contents of the stomach, without causing any depression of the system. It is applicable only to cases of poisoning, but as it is apt to act as a powerful irritant if it do not speedily produce vomiting, sulphate of zinc should be preferred to it for that purpose; for the same reason it should be given in the full doses above mentioned.

Ipecacuanha, L. E. Cephaëlis ipecacuanha, radix, D. *Ipecacuanha. Root of Cephaëlis ipecacuanha.* A native of Brazil; belonging to the Natural family *Cinchonaceæ*, and to the Linnæan class and order *Pentandria Monogynia.*

Botanical Characters.—Root perennial, generally simple; Stem, shrubby, ascending, 2 to 3 feet long; Leaves, opposite, ovato-lanceolate, 4 to 8 placed at the end of the stem and branches; Flowers, white, in terminal, pendulous heads; Fruit, a fleshy black berry.

Preparation.—The roots are gathered at all seasons of the year, cut from the stems, dried in the sun, and packed in bundles of various sizes.

Physical Properties.—Ipecacuan root is in pieces from three to six inches long, about the thickness of a writing pen, irregularly twisted and bent, presenting many circular depressions at short intervals, which give the root an annulated appearance, resembling a number of rings placed side by side on a common axis. It breaks with a short, clean fracture, presenting an outer cortical portion of a grayish, or grayish-brown colour, and a white woody centre *(meditullium)*. It is readily reduced to powder, which is of a pale brownish-yellow colour, has a faint, nauseous, peculiar odour, and a bitter, somewhat acrid taste.

Chemical Properties.—The cortical portion of the root is the more active; according to the analysis of Pelletier, it consists of 16 per cent of a peculiar principle named *emetina*, and in which the active properties of the drug reside, 2 of a fat oily matter, 6 of wax, 10 of gum, 42 of starch, and 20 of lignin. Emetina is prepared by dissolving 1 part of an alcoholic extract of ipecacuanha in 10 parts of water,

filtering to remove the fatty matter, and adding 1 part of calcined magnesia; evaporating with a gentle heat to dryness, pulverising, washing with cold water, drying and pulverising again; exhausting the powder with boiling alcohol, distilling off the spirit, treating the dry residue with weak sulphuric acid and animal charcoal; and finally precipitating the *emetina* with ammonia. Emetina, as commonly met with, is a dark pasty-looking substance, but when pure is white and pulverulent, inodorous, with a faint bitter taste, alkaline, very soluble in alcohol, sparingly soluble in water, and less so in ether; it is composed of $C^{35}$ $H^{25}$ $N^{1}O^{9}$. Ipecacuanha yields its active principles to water and to alcohol.

*Adulterations.*—Spurious ipecacuan roots are frequently substituted, especially on the Continent, for the true root, but as none of them present the precise characters of the latter, as given above, the fraud is readily detected. The powder is generally supposed to be adulterated, but of this we can only judge by its medicinal activity.

Therapeutical Effects.—In full medicinal doses, ipecacuan operates as a certain but mild emetic, at the same time increasing remarkably the secretions. It resembles tartar emetic in the time which elapses after it had been taken before its effects are produced, and also in the act of vomiting being repeated several times; and it differs from that substance in not causing so much nausea or general depression; it has less tendency to act on the bowels. As an emetic, ipecacuanha is adapted for children, for the old and debilitated, or for delicate females, where we wish to produce vomiting without depressing the vital powers; and also for cases, where the indication is to increase the secretions of the pulmonary organs. Thus, it is used with benefit in the gastric febrile disorders of children, to evacuate the contents of the stomach; at the approach of the paroxysm in ague, hysteria, or hooping cough, when it frequently checks the development of the fit; and it is generally given in conjunction with tartar emetic in the febrile and inflammatory disorders in which that substance is employed. As an emetic, ipecacuanha is to be preferred to tartar emetic, where there is any tendency to irritation or inflammation of the digestive organs; it is inferior to the metallic sulphates in cases of poisoning, on account of the slowness of its operation. *Emetina* has been very little used in medicine; the only advantages which it possesses over ipecacuanha are the smallness of the dose required to produce vomiting and its freedom from the unpleasant odour and taste of that substance: these are, however, more than counterbalanced by the dangerous symptoms which would result from an overdose.

Dose and Mode of Administration.—In powder, as an emetic, the usual dose of ipecacuanha is from gr. xij. to gr. xx.; but gr. v. or gr. vj., are frequently sufficient; it is best given mixed with warm water, and its action promoted by tepid drinks; gr. j. is usually sufficient to act as an emetic for an infant. In combination with tartar emetic, gr. xij., are mixed with gr. j., of that substance. The dose of impure *emetina* is from gr. ss. to gr. iij.; of the pure article from gr. $\frac{1}{8}$. to gr. ss.; either may be given dissolved in water with the aid of few drops of diluted sulphuric acid.—*Vinum Ipecacuanhæ*, D. L. E. (Ipecacuan root, bruised (in moderately fine powder, E.), ℥ij. (℥iiss. L. E.); sherry,

*by measure* ℔ij. (Oij. L. E.); macerate for 14 (7, E.) days and filter). As an emetic, very generally employed for children, in doses of from min. xx. to f℥i.; seldom for adults, dose, f℥ij. to f℥iv.—*Syrupus Ipecacuanhæ*, E. (Ipecacuan, in coarse powder, ℥iv.; rectified spirit, Oj.; proof spirit; and water, of each, f℥xiv.; syrup, Ovij.; digest the ipecacuan in f℥xv. of the rectified spirit at a gentle heat for 24 hours; strain, squeeze the residue, and filter. Repeat this process with the residue and proof spirit, and again with the water, unite the fluids and distil off the spirit till the residuum amount to ℥xij. Add to the residuum f℥v. of the rectified spirit, and then the syrup). This syrup is as effectually and much more simply prepared by dissolving an alcoholic extract of the root in distilled water, and adding syrup. It is an excellent preparation for children; about min. xl. of the *Edin.* preparation are equal in strength to one grain of ipecacuanha; the dose, as an emetic for adults, is f℥ij.; for children, min. xx. to f℥i.

Incompatibles.—The salts of lead, and of mercury; the vegetable acids; and all astringent vegetable infusions.

Scilla. *Squill* (described in the division *Diuretics)*, in full medicinal doses, generally produces nausea and vomiting, its action, however, is uncertain, and therefore it is not much used as an emetic. It is sometimes given to children with this intention in hooping cough, and in the advanced stages of bronchitis or of croup. In consequence of its stimulating effects, it is inadmissible where there is any tendency to inflammation. The preparation of squill usually employed as an emetic, is the following:—*Oxymel Scillæ*, D L. *Syrupus Scillæ*, E. ("Honey, despumated, *by weight* ℔iij.; vinegar of squill, *by measure* ℔ij. (Oiss. L.); boil with a gentle heat, in a glass vessel to the consistence of syrup," D. L. "Squill vinegar, Oiij.; pure sugar, in powder, ℔vij.; dissolve with the aid of a gentle heat, and agitation," E.). Dose, as an emetic, for children, f℥i. every quarter of an hour until vomiting is produced.

Sinapis, L. Sinapi, E. Sinapis nigra, seminum pulvis, D. *Flour of the seeds of Sinapis nigra*, D. L. E.—*generally mixed with those of Sinapis alba, and deprived of fixed oil by expression*, E. *Flour of mustard; Mustard.* Indigenous plants; belonging to the Natural family *Cruciferæ (Brassicaceæ*, Lindley), and to the Linnæan class and order *Tetradynamia Siliquosa.*

Botanical Characters.—Annual; Stem, 3 to 4 feet high; Lower leaves, large, lyrate, rough; Flowers, yellow; Pod with a very short beak, quadrangular; Seeds, dark brown. The white mustard is distinguished by the pod having a long beak, and by the seeds being yellow.

Physical Properties.—Although the Dublin and London pharmacopœias direct flour of mustard to be procured from the black variety only, table mustard, as met with in the shops and which is always used

in medical practice, is prepared from both varieties mixed in nearly equal proportions and ground. Mustard is a greenish-yellow powder, having an oily aspect, an acrid burning taste, and in the dry state a faint nauseous smell; but when moistened it emits a strong penetrating odour, very irritating to the eyes and nostrils. Black mustard is much more pungent than white.

Chemical Properties.—Black mustard seeds consist of a bland fixed oil, of a peculiar acid, bitter, odourless, and uncrystallizable, which has been named *myronic acid;* of another peculiar principle resembling vegetable albumen and emulsin, which has been named *myrosyne;* and of a third peculiar principle, crystallizable and very volatile, named *sinapisin;* with other unimportant matters. When water is added to mustard, by the mutual action of these principles, a pungent volatile oil is formed, and may be obtained by distillation, but this oil does not pre-exist in the seeds; and it is to its formation that the active properties of mustard are due.

*Adulterations.*—Flour of mustard is always more or less adulterated with a variety of substances. Wheaten flour which is generally (always according to Christison) mixed with it, may be detected by tincture of iodine turning a cooled decoction blue. Of any other sophistications, we can only judge by the physical properties of the specimen.

Therapeutical Effects.—Mustard is a powerful stimulating emetic, and should be preferred to any other remedy of this class, when the sensibility of the stomach is greatly reduced, or the vital power is low. Thus, it is employed with much advantage in narcotic poisoning, in intoxication threatening apoplexy, in malignant cholera, in some forms of apoplexy and of paralysis, and in suffocative catarrh occurring in the aged or debilitated.

Dose and Mode of Administration.—As an emetic, mustard is given in doses of ℥ss. to ℥i.; it is best administered mixed with f℥vj. or f℥viij. of tepid water.

Viola odorata.—The root of this plant (which has been described in the division *Cathartics*), though not officinal in the British pharmacopœias, possesses well marked emetic properties, which depend on the presence of an alkaloid named *violina;* this principle operates precisely similar to *emetina,* and has been found to exist in the roots of all the species of the genus Viola. In their action on the system, violet roots resemble ipecacuanha, for which they would form an excellent substitute; and as many of the species are indigenous, the subject is worthy of more attention than has been hitherto bestowed on it. The dose of the powdered root is from ℥ss. to ℥i.

Zinci sulphas. *Sulphate of Zinc* (described in the division *Astringents*), in full medicinal doses from gr. xv. to gr. xxx., operates as a speedy, safe, and efficacious emetic, not producing much nausea or

depression. It is therefore preferred to all other medicines of this class in cases of poisoning. It is also applicable to any case in which we wish to produce a single but complete evacuation of the contents of the stomach. As an emetic, sulphate of zinc is best administered in the full doses above stated, dissolved in three or four ounces of tepid water.

# CHAPTER X.

## EMMENAGOGUES.

Emmenagogues are medicines which are supposed to be capable of promoting the menstrual discharge. That any substances have a direct or specific power over the uterine organs has been doubted by many, in consequence of the uncertainty of the operation of the so called specific emmenagogues, and also as the uterus is not an organ intended for the elimination of foreign matter. But there are a few medicines which are employed to promote the menstrual secretion, and which appear to act solely as stimulants to the uterus, and these alone, will be considered in this chapter. Suppression or absence of the menstrual discharge is generally the effect of some morbid state of the system, and therefore the remedies which are to be employed must have reference to this morbid state. Thus, when amenorrhœa is the consequence of general debility, we must have recourse to tonics and stimulants; and when it occurs with a state of plethora, venesection and other debilitating plans of treatment must be employed. Substances which stimulate powerfully the neighbouring organs, act *relatively* on the uterine vessels, and therefore are often effectual in restoring the menstrual discharge. Thus, some of the more *acrid cathartics,* as aloes, black hellebore, gamboge, &c.; and the *stimulating diuretics,* as the turpentines, cantharides, &c., are frequently the most certain emmenagogues.

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Crocus, L. E. Crocus sativus, stigmata, D. *The stigmata of Crocus sativus; Saffron.* A native of Asia Minor, now naturalized in

England; belonging to the Natural family *Iridaceæ*, and to the Linnæan class and order *Triandria Monogynia*.

Botanical Characters.—Root, a round cormus; Leaves, linear, with a white central stripe; Flowers, appearing in September and October, light purple with red veins; Style single, stigma protruded, drooping, in three deep linear divisions, fragrant.

Preparation.—Early in the morning, the flowers are gathered, just as they are about to blow, and the stigmata with part of the style picked out, and the rest of the flower thrown away; the stigmata are then spread loosely on white paper, and dried on a small kiln of a peculiar construction. Formerly the over-ripe or injured stigmata were dried under pressure between folds of paper, when they constituted what was called *Cake saffron*, now no longer met with.

Physical Properties.—Saffron, *Hay saffron*, consists of the dried stigmata in loosely aggregated masses; the colour is deep orange, the odour powerful and agreeably aromatic, in large quantities stupifying; the taste is pungent, aromatic, and somewhat bitter. It is imported from Spain and France, English saffron being never met with in the market at present. According to Pereira, "one grain of good commercial saffron contains the stigmata and styles of nine flowers; hence, 4320 flowers are required to yield one ounce of saffron."

Chemical Properties.—Saffron consists of albumen, mucilage, a colouring extractive matter named *polychroite* and which constitutes ⅔ds of its weight, volatile oil, &c. It yields its properties readily to water and to alcohol; its solution in ether, being of a deep orange colour.

*Adulterations*.—In consequence of the high price of saffron, it is very much adulterated; the petals of the *Carthamus tinctorius* and of the *Calendula arvensis*, pomegranate blossoms, and fibres of smoked beef are used for this purpose. The flowers may be detected by the difference of their structure, when a specimen is soaked in water; the fibres of beef, by the odour which they emit on being burned. What is at present sometimes sold in England for *cake* saffron, consists of the petals of the *Carthamus tinctorius* made into a paste with gum water. Of the qualities of saffron, we judge by its sensible properties.

Therapeutical Effects.—Saffron is a stimulant of weak power, exerting a specific influence, by no means well marked, over the uterine organs; hence, it is generally said to be emmenagogue. In the present day it is scarcely ever employed in medicine, except to give odour and colour to mixtures. On the Continent it bears a high character as a remedy for the severe lumbar pains, which so frequently precede or accompany menstruation.

Dose and Mode of Administration.—In substance, gr. xij. to ʒj.—*Syrupus Croci*, L. E. (Saffron, ʒx.; boiling water, Oj.; sugar, ℔iij.; infuse the saffron in the water for 12 hours in a lightly covered vessel; strain the liquid and add the sugar to it). Dose, f ʒij. to f ʒss.; chiefly used for its fine colour.—*Tinctura Croci*, E. (Saffron, chopped fine, ʒij.; proof spirit, Oij.; prepared like tincture of cinchona, either by percolation or digestion, the former method being more convenient and expeditious). Dose, f ʒi. to f ʒij.

Ergota, L. E. *Acinula clavus*, L. *An undetermined fungus with degenerated seed of Secale cereale*, E. *Ergot of rye.* Much difference of opinion exists as to what this substance really is; the latest and best authorities agree, that it is a peculiar species of fungus, (*Spermoëdia Clavus* of Fries and Lindley; *Ergotœtia abortifaciens* of Quekett and Pereira), which is produced under certain circumstances as yet not fully ascertained, on plants belonging to the Natural families *Graminaceæ*, *Cyperaceæ*, and *Palmaceæ*, but on none so frequently as on the *Secale cereale* or common rye.

Physical Properties.—Ergot, or spurred rye, consists of angular, sometimes round bodies, from the third of an inch to an inch and a half in length, retaining the longitudinal depression of the sound grain, obtuse at the extremities, curved like the spur of a cock whence the name. It is of a violet-brown colour externally, sometimes whitish; yellowish internally. In the entire state, the odour is very faint, but when powdered it has a heavy, mawkish, somewhat animal smell; the taste is acrid and disagreeable; it is firm and fragile, breaking with a clear transverse fracture. It attracts moisture, if exposed to the air, swells, and becomes mouldy, and is attacked by a small insect a species of *acarus*, which devours the interior and leaves the grain a mere husk, no longer fit for medical purposes; ergot of rye should be therefore kept in well stopped bottles.

Chemical Properties.—According to the analysis of Dr. Wright, ergot consists of 31 per cent of a thick white oil, 5·50 of osmazome, 9 of mucilage, 7 of gluten, 11·40 of fungin, 3·50 of colouring matter, 26 of fecula, and 3·10 of salts. The fixed oil, on which Dr. Wright supposes the active properties of the drug depend, is of a reddish-brown colour, lighter than water, and soluble in alcohol, ether, the volatile oils, and solutions of the caustic alkalies; it is readily procured by evaporating with a gentle heat an ethereal tincture of the ergot prepared by percolation. M. Bonjean has very recently examined with great care the chemical, toxicological and therapeutical properties of ergot. He has found it to contain two very distinct active principles, the one a soft, reddish-brown extract, very soluble in water, which he has named *ergotin*, and on which the obstetrical and antihemorrhagic properties of the substance depend; and the other, a colourless fixed oil, very soluble in ether, and which alone is the poisonous principle. From these results then it would appear that water must be the best menstruum for extracting the active principles of ergot of rye.

*Adulterations.*—Plaster of Paris, and common paste artfully coloured, are substituted for, or mixed with, ergot of rye; they are difficult of detection. We should, therefore, attend to the characteristics of good ergot as given by Wright.—"It should be clear and smooth on the surface, not powdery, of a deep purple colour, neither totally black nor light brown, having a full strong odour, breaking clearly, exhibiting a pink blush interiorly, unpunctured by insects, burning with a clear jetting flame, and being of a less specific gravity than water." But Bonjean states that he has found ergot which is white internally, fully as active as that which is pink.

Therapeutical Effects.—Ergot of rye in single large doses, from

℥ij. to ℥viij., produces nausea, pain in the head, and vertigo, generally followed in from twelve to twenty-four hours by delirium and stupor, with dilatation of the pupil and great depression of the pulse. In medicinal doses, from gr. xv. to gr. xl., it exerts a specific influence on the uterine organs, chiefly manifested by a stimulant effect on the muscular fibres of the uterus, exciting them to increased contraction. Ergot of rye is chiefly used in medicine, to accelerate delivery in cases where the childbirth is delayed, in consequence of feeble or languid contractions of the uterus; to cause the expulsion of the placenta retained from a similar cause; to stimulate the uterus to expel sanguineous clots, hydatids, or polypi; to promote the lochial discharge, and to check leucorrhœa, or hemorrhage from the womb; all of which effects are the result of augmented contractility of the uterus. The power of ergot to produce the catamenial discharge in amenorrhœa is doubted by many, nevertheless in chlorotic amenorrhœa after the administration of ferruginous preparations for some days, I have in several cases employed the tincture with most beneficial results. The circumstances which contraindicate the employment of ergot in parturition, are want of dilatation of the os uteri, great rigidity of the soft parts, deformity of the pelvis, and mal-presentation. Most practitioners also agree in advising that it should not be administered in the earlier stages of labour, or in first pregnancies. It is now very generally admitted that the administration of ergot of rye during labour endangers the life of the fœtus; and that this depends on the poisonous action of the drug as evidenced by its effects on the action of the heart both of the mother and child, is shown in a valuable report by Dr. Hardy, in the 27th Vol. of the *Dublin Medical Journal*. It is therefore requisite that after the administration of ergot during labour, any change in the action of the fœtal heart, should be carefully watched by the employment of the stethescope, and if the number of the beats be reduced below 110, *with intermissions*, instrumental delivery must be had recourse to, to save the life of the child. The *ergotin* of M. Bonjean is, however, stated by him to be entirely void of the poisonous property, and, if such be proved to be the case, this great objection to the employment of ergot will be overcome by the use of it. The effects produced by the continued use of ergot as an article of food are very singular, and have been fully described by different writers; any detailed account of them, however, would be quite foreign to the scope of this work; I must, therefore, refer the reader to Dr. Wright's excellent treatise in the 52nd and 53rd Vols. of the *Edinburgh Medical and Surgical Journal*.

Dose and Mode of Administration.—In powder, which should be always prepared for use, for a woman in labour, the dose is ℈j. repeated every half hour until ℥i. has been taken, unless its effects are sooner produced. For other cases, gr. v. to gr. x. three times a day; it may be administered diffused through peppermint or cinnamon water.—*Ergotin*, Bonjean. (Exhaust any quantity of powdered ergot of rye in a displacement apparatus with water; heat the solution in a water-bath to coagulate the albumen; filter; evaporate the filtered liquid to the consistence of a clear syrup, add to it rectified spirit in excess; set it aside until all the gummy matters are precipitated and the liquid becomes

again transparent; pour off from the sediment and evaporate in the vapour bath to the consistence of a soft extract). By this process a reddish-brown, homogeneous extract is obtained; it has a pungent bitter taste, and an odour resembling that of roast meat. It forms with water a beautiful red solution, limpid and transparent. 500 parts of ergot yield from 70 to 80 of ergotin. The dose of it is from gr. iss. to gr. iij. every quarter of an hour during labour, and in other cases this quantity may be administered throughout the day. It may be given in the form of pill made with liquorice powder, or dissolved in water and sweetened with syrup of orange flowers. There are no officinal preparations of ergot, but the following are in general use.—*Infusum Ergotæ.* (Ergot, bruised, ʒj.; boiling water, fʒiv.; macerate till cold in a lightly covered vessel and strain). Dose, during parturition, ½d of this, repeated at intervals of half an hour, unless its effects be sooner produced; for other cases, the dose is fʒss. to fʒi.; some aromatic tincture should be added to this preparation and to the next, to conceal their nauseous taste.—*Decoctum Ergotæ.* (Ergot, bruised, ʒi.; water, fʒvj.; boil for ten minutes and strain). Dose, same as infusion.—*Tinctura Ergotæ*; Apothecaries' Hall, London. (Ergot, bruised, ℥ij.; proof spirit, Oj.; digest for 4 days and strain). This tincture might be more conveniently prepared by percolation. Dose, in slow parturition, fʒss. to fʒj.; in other cases, min. x. to min. xx.—*Tinctura Ergotæ etherea.* (Similarly prepared, substituting sulphuric ether for proof spirit). The dose is the same.

Rubia tinctorum, radix, D. *Root of Rubia tinctorum; Madder.* A native of the South of Europe; belonging to the Natural family *Stellatæ (Galiaceæ,* Lindley), and to the Linnæan class and order *Tetrandria Monogynia.*

Botanical Characters.—Root, perennial, long, succulent, horizontal; Stems, several, quadrangular, jointed, procumbent; Leaves, membranaceous; Flowers, small, yellow.

Physical Properties.—Madder root is imported from the Levant; it is in long cylindrical pieces, about the thickness of a goose quill, deep reddish-brown externally, reddish-yellow internally. It has a feeble, unpleasant odour, and a bitter austere taste.

Chemical Properties.—There are no less than five colouring matters in madder, namely, purple, yellow, red, orange, and brown; consequently it is much employed in the arts for dyeing. Any medical virtue it possesses must depend on a small quantity of bitter extractive it contains. It imparts its odour and taste to water, alcohol and ether.

Therapeutical Effects.—Madder has fallen into complete disuse, so much so that it has been expunged from the last editions of the London and Edinburgh Pharmacopœias. Taken internally for any length of time, the various secretions, and even the substance of the bones are coloured red. It was highly esteemed by Dr. Home as an emmenagogue; the dose of it is from ʒss. to ʒij., three or four times a day.

Ruta graveolens. *Rue* (described in the division *Antispasmodics)*, was formerly highly esteemed as an emmenagogue, and at present is a popular remedy as such; it is sometimes resorted to for the purpose of procuring abortion. Although it undoubtedly possesses a direct stimulating influence on the uterine organs, it is scarcely ever employed in regular practice in the present day, for any of the purposes for which this class of remedies is administered.

Sabina, L. E. Juniperus sabina, folia, D. *Leaves (tops,* E.—*tops both fresh and dried,* L.) *of Juniperus sabina. Savin.* A native of the South of Europe, cultivated in this country; belonging to the Natural family *Coniferæ (Pinaceæ,* Lindley), and to the Linnæan class and order *Diœcia Monadelphia.*

Botanical Characters.—An evergreen, small, bushy shrub; Leaves, very small, ovate, pointed, densely imbricated; it flowers in April and May, and ripens its fruit, a dark purple *galbulus* or berry about the size of a currant, in autumn.

Physical Properties.—As met with in the shops, savin consists of the young tops and their attached leaves; in the fresh state they are of a bright green colour, have a heavy, peculiar, terebinthinate odour, and a bitter nauseous taste. When dry their colour is yellowish-green, and their odour much weaker.

Chemical Properties.—Savin tops consist of resin, volatile oil, gallic acid, extractive, &c. The medicinal properties are due to the volatile oil, *Oleum Sabinæ,* D. E., and which may be obtained by distillation with water, ℔ij. of the tops yielding f℥v. of oil; it is limpid and nearly colourless, having the odour of the plant, and a hot acrid taste; its composition is $C^{10}$ $H^{8}$, being isomeric with oil of turpentine; and its density 0·915. Savin communicates its odour and taste to water and to alcohol; the alcoholic tincture is of a bright green colour.

Therapeutical Effects.—Savine is a powerful stimulant to the uterine organs, and is employed as an emmenagogue with much benefit in amenorrhœa and chlorosis, depending on torpor or deficient action of the uterine system. In consequence, however, of its poisonous properties it should be used with caution; its employment is contraindicated where there is the least tendency to irritation or inflammation of the uterus or any of the pelvic viscera. Savin is the drug usually resorted to by the vulgar for the purpose of producing abortion, but it can not effect this, except at the risk of the life of the mother.

Dose and Mode of Administration.—In powder, a bad form, the dose is from gr. v. to gr. xv. The dose of the oil is from min. ij. to min. vj.—*Infusum Sabinæ.* (Fresh savin tops, ℥i.; boiling water, f℥viij.; macerate for one hour in a covered vessel). Dose, f℥ss. to f℥j.

In cases of poisoning with savin, emetics should be first employed to remove the poison from the stomach; and afterwards opiates and demulcents, to be followed by general antiphlogistic treatment.

Sodæ biboras. *Borax* (described in the division *Astringents)*, though not ordinarily employed in medicine as an emmenagogue possesses a powerfully stimulant action on the uterine organs. It is sometimes used empirically to cause abortion, an effect which its incautious administration in regular practice has in more than one instance produced.

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# CHAPTER XI.

## EMOLLIENTS,

(Demulcents; Relaxants).

Emollients may be defined substances which diminish the vital tone or cohesion of the solid tissues of the body, and thereby render them more lax and flexible; or which by diminishing acrimony, protect the sensible surface of the body from the action of acrid matter. This division of medical agents has been stated by many to act merely mechanically, by lubricating and softening the parts to which they are applied, or by sheathing them from the action of matters which are capable of irritating them. But this explanation cannot possibly apply to those substances, which when introduced into the stomach operate on remote parts of the body. Emollients, therefore, seem to act either directly on the part to which they are applied, or indirectly through the medium of the circulation. They are principally employed in the treatment of inflammations either general or local, in painful ulcerations, in diseases of the urinary organs, and in poisoning with acrid substances; but in all these cases they are only used to alleviate symptoms. Of the non-medicinal substances used as emollients, warm water is the most important, and the higher the temperature at which it can be applied without the actual production of pain, the greater will be its emollient power; for this reason, it will be found productive of most advantage, when employed in the form of vapour.

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Adeps suillus, D. Adeps, L. Axungia, E. *Fat of Sus scrofa; Hog's-lard; Axunge.* *Sus scrofa*, the common hog, belongs to the class *Mammalia*, order *Pachydermata*. The fat is usually taken from about the loins, from the omentum and from the mesentery, and is melted and strained to separate the membranes.

PREPARATION.—Lard as sold for general use usually contains salt, which has been added to prevent it from becoming rancid; consequently to prepare it for medical purposes, the following formula is given in the *Dublin Pharmacopœia*.—*Adeps suillus præparatus.* "Melt fresh lard, cut into small pieces, with a gentle heat, and strain it by pressure through linen; the lard, prepared by those who sell it, and which is preserved with salt, is to be melted with twice its weight of water frequently stirring the mixture, then set aside, and the lard separated when cold."

PHYSICAL PROPERTIES.—Axunge is a white, solid, fatty matter, with a very faint odour, and a mild sweetish taste. Sp. gr. ·881.

CHEMICAL PROPERTIES.—It is composed of 38 per cent of *stearin* and *margarin*, and 62 of *oleïn* or *elaïne*. It melts at about 85° F. into a clear transparent liquid, which if water be present is whitish or milky; exposed to the air axunge undergoes a process of decay, becoming *rancid*, when it acquires a peculiar unpleasant odour and acrid properties; in this state it is unfit for medical purposes.

THERAPEUTICAL EFFECTS.—Axunge is not used in medicine internally, its action on the body is nutritive and emollient. As an external agent it is employed as a basis for ointments, cerates, and liniments.

ADEPS OVILLUS, D. SEVUM, L. E. *Fat of Ovis aries; Suet; Mutton suet. Ovis aries*, the sheep, belongs to the class *Mammalia*, and order *Ruminantia*. The fat is selected from the neighbourhood of the kidneys, melted, and strained to separate the membranes. Mutton suet is nearly similar in physical and chemical properties to axunge, and is employed for the same purposes; it is sometimes preferred to axunge in consequence of its greater consistence and higher melting point.—*Adeps ovillus præparatus*, D., is prepared in the same way as prepared hog's-lard.

ALTHÆA OFFICINALIS, FOLIA ET RADIX, D. L. E. *The leaves and root of Althæa officinalis; Common Marsh-mallow.* An indigenous plant; belonging to the Natural family *Malvaceæ*, and to the Linnæan class and order *Monadelphia Polyandria.*

BOTANICAL CHARACTERS.—Stem, two to three feet high, downy; Leaves, heart-shaped, exquisitely soft and pubescent; Flowers, on axillary stalks, large, pale rose-colour.

PHYSICAL PROPERTIES.—The roots are fusiform, from 12 to 18 inches long, about the thickness of the finger, yellowish externally, white and fibrous within; the odour is faintly nauseous, the taste sweet, and very mucilaginous. The leaves have a weaker odour, and a less mucilaginous taste.

CHEMICAL PROPERTIES.—The roots consist of gum, uncrystallizable sugar, starch, yellow colouring matter, *asparigin*, albumen, &c. They yield their mucilaginous properties to water.

THERAPEUTICAL EFFECTS.—Marsh-mallow root is one of the most

commonly employed emollients on the continent, but is not much used in this country. As an internal remedy it is given in inflammation of the mucous membranes, as in gonorrhœa, cystitis, nephritis, bronchitis, &c., either alone or as a vehicle for other medicines. Externally, the leaves are generally employed in the acute phlegmasiæ in the form of decoction or cataplasm.

Dose and Mode of Administration.—*Decoctum Althææ*, D. *Mistura Althææ*, E. (Dried root (and herb, D.) of althæa officinalis, ʒiv.; raisins, freed of the seeds, ʒij.; boiling water, *by measure* ℔vij. (Ov., E.); boil down to ℔v. (Oiij., E.); strain through linen or calico; and when the sediment has subsided, pour off the clear liquor for use). Dose, fʒi. to fʒij. frequently repeated.—*Syrupus Althææ*, D. L. E. (Fresh althæa root, bruised (sliced, E.), ℔ss. (ʒviij., L. E.); pure sugar, ℔ij. (℔iiss., L. E.); water, *by measure* ℔iv. (Oiv., L. E.); boil the water with the root down to one half; (strain through calico, E.), and express the cooled liquor; set aside for 24 hours that the dregs may subside; pour off the clear liquor, add the sugar, and boil down to a proper consistence). This syrup does not keep well. The dose is from fʒss. to fʒi.

Incompatibles.—Iodine; and tincture of the muriate of iron.

Amygdalæ amaræ; Amygdalæ dulces, D. L. E. *Kernels of the two varieties of Amygdalus communis. Bitter almonds; and Sweet almonds.* The almond tree is a native of Syria, and Barbary; but grows freely throughout the South of Europe; it belongs to the Natural family *Rosaceæ (Drupaceæ*, Lindley), and to the Linnæan class and order *Icosandria Monogynia.*

Botanical Characters.—A small tree, with acuminate, serrulate leaves, petiolate; Gland on the petioles of the bitter almond variety, on the leaves of the sweet almond; Flowers, sessile, appearing before the leaves, white or rose-coloured; Fruit, an ovoid drupe, leathery, marked with a longitudinal furrow where it opens when ripe, containing a hard rough shell *(putamen)* marked with pits or furrows, within which is the seed or kernel.

Physical Properties.—Sweet almonds vary in size, from half an inch to above an inch in length, and are about three-eighths of an inch in breadth; they are oblong, compressed, and pointed at one end; the *episperm* or outer covering is reddish-brown covered with a yellowish dust; the parenchyma or *episperm* is white, hard and oleaginous, inodorous, having a sweet bland taste. Bitter almonds are generally smaller, they are characterised by their bitter taste, and peculiar odour when rubbed with water. Several sorts of sweet almonds are met with in commerce, the principal of these are Jordan and Valentia almonds; the former come from Malaga, and are the most esteemed; they are longer and more pointed than the latter, which are brought from Valentia. Bitter almonds are imported from Mogadore.

Chemical Properties.—Sweet almonds consist of fixed oil, emulsin, liquid sugar, gum, &c. In addition to these the bitter almond contains

a peculiar principle named *amygdalin*, which, when brought in contact with water, from a mutual re-action between it and the emulsin generates an essential oil, which will be more particularly described hereafter, (See *Sedatives*). The fixed oil, *Oleum Amygdalarum*, D. L. is an article of the Materia Medica in the latter pharmacopœia; the former directs it to be prepared, "by bruising fresh almonds in a mortar, and expressing without heat." For this purpose either sweet or bitter almonds may be employed, the latter as being cheaper are generally used; 1 *cwt.* of almonds yields from 48 to 52 ℔s. of oil. It is a bland, pale-yellow, inodorous, very liquid oil; lighter than water, its density being about ·920; it consists of 76 per cent of *oleïne*, and 24 of *margarine*; it requires 6 parts of boiling, or 25 of cold alcohol for its solution; but is very soluble in ether.

Therapeutical Effects.—Sweet almonds are nutritive and emollient; they should be *blanched*, deprived of the husk or pellicle, before being used, as from its acridity it has been known to produce nausea and irritation of the stomach and bowels, in some instances followed by an eruption on the skin. In medicine the preparations of the sweet almond are used as emollients, chiefly in inflammation of the genito-urinary mucous membrane to lessen the acrimony of the urine, and with the same intention in calculous affections. The oil is seldom given internally, according to some it possesses mildly laxative properties; externally it is used for frictions, and as an ingredient in some soaps.

Dose and Mode of Administration.—*Confectio (Conserva*, E.*) Amygdalarum*, D. L. E. (Sweet almonds, ℥viij.; powdered gum arabic, ℥j.; pure sugar, ℥iv.; blanch the almonds, and beat them with the gum and sugar into a uniform pulpy mass. "This confection may be kept unchanged longer if the almonds, acacia, and sugar, separately powdered, are afterwards mixed, then whenever the confection is to be used, beat all the ingredients together until they are thoroughly incorporated," L.). This confection is only used for the preparation of the emulsion.—*Mistura Amygdalarum*, D. (Blanched sweet almonds, ℥iss.; bitter almonds, ℈ij.; pure sugar, ℥ss.; water *by measure* ℔iiss.; rub the almonds with the sugar, adding the water gradually, and strain).—L. E. (Almond confection, ℥iiss. (℥ij., E.); water, (distilled, L.), Oj. (Oij., E.); add the water to the confection gradually, triturating until they are mixed; and strain through linen. Or it may be prepared as follows, E.—"Sweet almonds, ℥j. ℥ij.; pure sugar, ℥v.; mucilage, f℥ss.; water, Oij.; blanch the almonds, beat them to a smooth pulp in an earthen-ware mortar, first with the sugar, then with the mucilage; add the water gradually, constantly stirring, and strain through linen or calico"). Generally employed as a vehicle for other medicines in doses of f℥i. or f℥ij.; the few bitter almonds in the Dublin preparation give it an agreeable flavour. Acids, and alcohol, and of course tinctures, are incompatible with almond emulsion.

Amylum, D. L. E. *Fecula of the seeds of Triticum hybernum*, D. L.—*of Triticum vulgare*, E. *Starch; Wheaten starch.* The common wheat, *Triticum hybernum*, is a native of the country of the Baschkirs, and is

cultivated throughout all Europe. It belongs to the Natural family *Graminaceæ*, and to the Linnæan class and order *Triandria Digynia*.

Botanical Characters.—Culms, simple, glaucous, jointed; Leaves, alternate, linear, smooth, of a glaucous-green colour; Flowers, glumaceous, at the extremity of the culm; Seed (grain) ovoid, yellowish, with a longitudinal furrow.

Preparation.—The fecula or starch forms nearly 70 per cent. of wheaten flour. It is procured by steeping the flour in water for one or two weeks until it becomes sour, drawing off the supernatant liquor; washing the residuum on sieves with repeated portions of water, allowing the liquor which passes through to deposit the starch in large vats; and finally draining the deposited starch, and drying it in a stove.

Physical Properties.—Starch usually occurs in the form of small, irregular, hexagonal prisms; it is white, pulverulent, unalterable in the air, crackling under the fingers when lightly pressed, inodorous and insipid. Viewed under the microscope it is found to consist of various sized transparent particles, rounded or angular, uneven on the surface.

Chemical Properties.—The particles of starch are composed of an external tegument termed *Amylin*, and a contained mucilage named *Amidin*. Its ultimate analysis is $C^{12}$ $H^{20}$ $O^{10}$, Payen. Starch is insoluble in cold water, but may be suspended in it by trituration; it is also insoluble in alcohol and ether. In water near the boiling point it dissolves almost completely, and if sufficiently concentrated forms with it an opaque jelly, which becomes more consistent as it cools. By roasting starch, it is rendered somewhat analogous to gum, and is then soluble in cold water. With a cooled decoction of starch, iodine forms a rich blue compound *(iodide of starch)*, which varies in the intensity of the colour, as the iodine or starch predominates. It is only on the Amidin that iodine acts, not altering the colour of the Amylin, consequently it produces no effect on starch when merely moistened with water, requiring either trituration or heat to burst the tegumentary membrane. Amidin constitutes 995 or 996 thousands of starch, Amylin only 4 or 5 parts in a thousand.

*Adulterations.*—Starch is often adulterated with sulphate of lime; it may be detected by incineration, the starch being burned away and leaving the fixed sulphate. Its weight is often increased by the presence of superabundant moisture, which may be discovered by drying starch in a vapour bath, and ascertaining the loss of weight, which should not be more than ten or twelve per cent. Potato starch is sometimes sold for wheaten starch; this fraud may be readily detected by the microscope the particles of the former being much larger than those of the latter; it may be also discovered by triturating for a short time a small quantity of a suspected specimen with water in an *agate* mortar, and adding to the strained solution a few drops of tincture of iodine,—if it be pure wheaten starch a pale yellow colour only will be produced, but if potato starch be present the coloration will be deep blue.

Therapeutical Effects.—Wheaten starch is employed in medicine, chiefly in the form of decoction, as an emollient enema in dysentery, diarrhœa, or other inflammatory affections of the abdominal viscera; it is also used as a vehicle for more active remedies, and for suspending drugs

which are administered in the state of powder. Externally, starch in fine powder is applied to excoriated parts, and for preventing the formation of bed sores.

Dose and Mode of Administration.—*Mucilago (Decoctum,* L.*) Amyli,* D. L. E. (Starch, ʒvj. (ʒiv., L. E.) ; water, *by measure* ℔j. (Oj., L. E.) ; triturate the starch with the water gradually added, and boil for a short time). Used in the form of enema either alone or as a vehicle for other remedies.

Avena, L. E. Avena sativa, farina ex seminibus, D. *The seeds (freed from the husks,* L.*) of Avena sativa,* L. E. *Oatmeal,* D. *Avena sativa,* the common oat, is generally cultivated throughout the whole of Europe; it belongs to the Natural family *Graminaceæ,* and to the Linnæan class and order *Triandria Digynia.*

Botanical Characters.—Root annual; Culm, from two to three feet high; Leaves, linear, acute; Flowers, glumaceous, disposed in loose, terminal, somewhat pendant panicles; Seeds, more or less elongated, pointed at both extremities, convex at one side, marked with a longitudinal furrow on the other, white, in some varieties black.

Preparation.—Oats deprived of their husk are called *groats,* which, when coarsely ground constitute *oatmeal;* the husks with some adhering starch from the seeds are sold under the name of *seeds.* These different preparations are too well known to need description.

Properties.—Oats consist of 66 per cent of meal, and 34 per cent of husk or *Bran.* The dried meal consists of starch, mucilage, sugar, albumen, and lignin, but no gluten. Oatmeal or groats boiled with water, in the proportion of about ʒiij. to Oiij. of water, down to one half, constitutes *gruel,* a light article of diet for the sick or convalescent. If a larger proportion of the coarsely ground meal be used, it is called *porridge,* a principal article in the dietaries of hospitals and charitable institutions, and forming a staple article of food in Scotland and the North of Ireland.

Therapeutical Effects.—Oatmeal is nutritive and emollient; it is only employed in medicine internally in the form of *gruel* above referred to. Externally it is sometimes used in the form of poultice, prepared as *porridge,* but with less boiling; it enters into the composition of the *Cataplasma simplex,* D.

Cera, L. Cera flava, D. E. *A concrete prepared by Apis mellifica,* L.—*Waxy secretion of Apis mellifica,* E. *Bees-wax.*

Cera alba, D. L. E. *White wax; Bleached bees-wax.* Wax is a product of many vegetables; but the wax employed in medicine is a secretion of certain glands, *wax pockets,* situated on the abdomen of the common bee, it is used by the insect for constructing the cells of the honey-comb.

Preparation.—It is obtained from the comb, after the honey has been removed by dripping and expression, by melting it in water and straining so as to free it from impurities; in this state it constitutes yellow wax. White wax is procured from this, by melting and agitating with water, and finally bleaching in thin ribbons in the open air; the process being repeated until it loses all colour and odour.

Physical Properties.—*Yellow wax* is in large cakes of the shape of the mould in which it has been allowed to cool; it has a gamboge-yellow colour, a dull lustre, a peculiar sweet odour, and a faint greasy taste; sp. gr., when pure, ·962. *White wax* is in white cakes, with a faint yellow tinge; it is feebly translucent, inodorous, and insipid; sp. gr. same as that of yellow wax.

Chemical Properties.—White wax consists of two substances, *cerine* and *myricine* (John); its ultimate analysis is $C^{20}$ $H^{20}$ O (Hess); yellow wax contains a little more carbon and a little less oxygen (Lewy). It is insoluble in water, and in alcohol and ether when cold; but is soluble in boiling alcohol and ether, in the fixed oils and in oil of turpentine. It fuses at 155°, and is inflammable, burning without any residuum when pure. It combines with fats and resins when heated with them.

*Adulterations.*—Wax is adulterated; with starch, which may be detected by the action of tincture of iodine on cooled water in which it has been boiled; with resin, which may be dissolved out by alcohol; with fat or grease, which emit a peculiar odour when burned; and with flour of sulphur and other earthy or metallic substances, which are left when wax is dissolved by oil of turpentine.

Therapeutical Effects.—Wax acts as an emollient, and was formerly employed as such in ulcerations of the intestines, but at present it is not used as an internal remedy. As an external agent, it forms the basis of all cerates, and is an important constituent of many ointments and plasters.

Pharmaceutical Preparations.—*Unguentum Ceræ albæ,* D. (White wax, ℔j.; prepared hog's-lard, ℔iv.; make into an ointment).—*Ceratum* L. *Ceratum simplex,* E. (Olive oil, fʒiv. (6 parts, E.); white wax, ʒiv. (3 parts, E.); (spermaceti, 1 part, E.); "add the oil to the melted wax and mix them," L. "heat the oil gently, add the wax and spermaceti, stir the whole briskly when it is fluid, and continue the agitation as it cools," E.). These preparations commonly known as *simple cerate,* are used as mild and cooling dressings.—*Unguentum Ceræ flavæ,* D. (Prepared in the same manner as white wax ointment substituting yellow wax).—*Emplastrum Ceræ,* L. *Emplastrum simplex,* E. (Wax, ℔iij. (ʒiv, E.); suet, ℔iij. (ʒij., E.); resin, ℔j. (ʒij., E.); "melt together, and strain," L.—"melt them together with a moderate heat, and then stir the mixture briskly till it concretes on cooling," E.). Chiefly used for preparing cantharides plaster.—*Linimentum simplex,* E. (Olive oil, 4 parts; white wax, 1 part, dissolve the wax in the oil with a gentle heat, and stir well, as the fused mass cools and concretes). An emollient liniment.

Cetaceum, D. L. E.—*Spermaceti. A concrete found in peculiar cells of the head of Physeter macrocephalus,* L. *Cetin of Physeter macrocephalus, nearly pure,* E. *Physeter macrocephalus,* the great-headed cachalot, is a gregarious whale, inhabiting the Pacific Ocean,

and the Indian and Chinese Seas; it belongs to the class *Mammalia*, order *Cetacea*.

Preparation.—Although spermaceti is found in various parts of the body of the animal mixed with common fat; it is chiefly obtained from a large, triangular-shaped reservoir, existing in the head over the surface of the upper jaws, in which it is contained dissolved in oil, forming a milky-looking, oleaginous fluid. It is separated from the oil by boiling in water, from which the spermaceti crystallizes as it cools; it is then purified by being re-melted in a weak solution of potash, and the impurities skimmed off, and finally melted a third time by the agency of steam, and cooled slowly in tin moulds.

Physical Properties.—Spermaceti occurs in various sized crystalline masses, beautifully white, which are formed of an infinite number of small brilliant scales; it is soft and unctuous to the touch, inodorous, and insipid. Sp. gr. ·943.

Chemical Properties.—It is composed of 2 atoms of *margaric acid*, 1 of *oleic acid*, 3 of *cetene*, and 3 of water. It may be readily pulverised by the addition of a few drops of alcohol, or of almond oil; it is fusible at 112°, combustible, insoluble in water, and only slightly soluble in alcohol, even at a boiling temperature; it combines with fixed or volatile oils, and with melted fats.

Therapeutical Effects.—Spermaceti is an emollient, and demulcent, but at present is not used internally. Externally, it is employed as an ingredient in various cerates and ointments.

Pharmaceutical Preparations.—*Unguentum Cetacei*, D.—*Ceratum Cetacei*, L. (White wax, ℔ss. (℥viij., L.); spermaceti, ℔j. (℥ij., L.); (prepared hog's-lard, ℔iij., D.; olive oil, Oj., L.); melt with a gentle heat (add the oil to the spermaceti and wax melted together, L.), and stir them with a spatula until cool). An emollient and cooling dressing for raw or blistered surfaces.—*Unguentum Cetacei*, L. (Spermaceti, ℥vi.; white wax, ℥ij.; olive oil, f℥iij., being melted together with a slow fire, stir constantly till they become cold). Similar to the last, but a softer preparation.

Cydonia, L. *Quince-seeds; The seeds of Cydonia vulgaris.* The quince tree is a native of the South of Europe; belonging to the Natural family *Rosaceæ (Pomaceæ*, Lindley), and to the Linnæan class and order *Icosandria Pentagynia*.

Botanical Characters.—A small, much branched tree; Leaves, ovate, obtuse, their under surface tomentose; Flowers large, solitary or few, pale rose colour; Fruit, a variously shaped pome, yellow, austere, but very fragrant, containing many seeds.

Physical Properties.—Quince seeds, are ovate, pointed, plano-convex, of a reddish-brown colour, inodorous, leaving a bitter impression on the palate when chewed for some time.

Chemical Properties.—The episperm of the seed contains a large quantity of mucilage named by Pereira *Cydonin*. The substance of the seed contains, besides other matters, emulsin and fixed oil, consequently

emitting when moistened the bitter almond odour. The mucilaginous principle is dissolved out by boiling water.

THERAPEUTICAL EFFECTS.—Quince seeds are only employed in medicine for the mucilage which they contain, the decoction has been recommended as an emollient application to erysipelatous surfaces, and to aphthous ulcerations of the mouth.

PHARMACEUTICAL PREPARATIONS.—*Decoctum Cydoniæ*, L. (Quince seeds, ʒij.; distilled water, Oj.; boil for ten minutes over a slow fire, and strain). Never used internally. It does not keep well.

INCOMPATIBLES.—Alcohol; acids; most metallic solutions; and tincture of galls.

FARINA, L. E. TRITICUM HYBERNUM, SEMINUM FARINA, D. *Flour of the seeds of Triticum hybernum*, D. L.—*of Triticum vulgare*, E. *Wheaten flour*, (See *Amylum*).

Flour is employed in medicine for dusting excoriated or burned parts; in the form of bread it is used as a basis for making pills, but as it always contains salt, it should not be employed for that purpose with substances which are decomposed by muriate of soda, as the salts of silver, &c.

FICI, L. E. FICUS CARICA, FRUCTUS SICCATUS, D. *Figs. The dried fruit of Ficus carica*. A native of Asia, and the South of Europe; belonging to the Natural family *Urticaceæ* (*Moraceæ*, Lindley), and to the Linnæan class and order *Polygamia Diœcia*.

BOTANICAL CHARACTERS.—A small tree, with large, cordate, palmate, leaves; Flowers numerous, pedicellated, inclosed within a fleshy receptacle, which is umbilicated and nearly closed at the apex, hollow within; Drupe or utricle, one-seeded, sunk into the pulpy receptacle.

PHYSICAL PROPERTIES.—Figs consist of the fleshy, pyriform receptacle, containing within, numerous, small, crustaceous seeds. When fully ripe they are dried in the sun, and packed in drums or baskets, in which forms they are imported, those in drums from Smyrna (*Turkey figs*), those in baskets from Spain and Portugal (*Portuguese figs*). Dried figs are too well known to require description.

CHEMICAL PROPERTIES.—Dried figs consist of 62 per cent of *sugar of figs*, with gum, fatty matter, extractive and salts. They yield their sugar and gum to boiling water.

THERAPEUTICAL EFFECTS.—Figs are nutritive and emollient, and in large quantity gently laxative; they are more employed as an article of the table than in medicine. They enter into the composition of the *compound decoction of barley*, and the *confection* or *electuary of senna*. Roasted figs are applied to gum boils to promote suppuration.

Glycirrhiza glabra, D. L. E.—*The (fresh* L.*) root, (and extract* E.*) of Glycirrhiza glabra. Liquorice.* A native of the South of Europe, now cultivated extensively in England; belonging to the Natural family *Leguminosæ (Fabaceæ,* Lindley,) and to the Linnæan class and order *Diadelphia Decandria.*

Botanical Characters.—Root long, creeping, succulent; Stem, erect, smooth, 4 to 5 feet high; Leaflets, ovate, retuse, yellowish; Flowers, axillary, racemose, papilionaceous, bluish or purplish.

Preparation.—The root is dug up in November, when the plant is three years old, washed, and the small fibres cut off; it is imported in large quantities from Spain and Portugal, but that grown in England is most esteemed. It may be kept fresh for many months by covering it with sand in a damp cellar.

Physical Properties.—Liquorice root is in cylindrical pieces, from one to two or three feet long, smooth and plump when fresh, wrinkled in the dry state, about the thickness of the little finger, of an umber-brown colour externally, yellow internally; it has a faint earthy odour, and a sweet mucilaginous, subacrid taste.

Chemical Properties.—It consists of a peculiar saccharine principle named *glycirrhizine,* albumen, fecula, *asparigin* or a principle analogous to it, some salts, and a thick, acrid, resinous oil. It yields its active principles to boiling water, but as the acrid oil is dissolved out by the aid of heat, the Edinburgh College directs cold water to be used for preparing the extract.

*Adulterations.*—Liquorice powder is often adulterated on the Continent with a yellow pigment *(French yellow),* which is readily detected, as it effervesces on the addition of muriatic acid.

Therapeutical Effects.—Liquorice root is emollient, and demulcent; it is chiefly employed in the form of extract or decoction in catarrhal affections; it is also used to give flavour to other medicines. Liquorice powder is employed in pharmacy as a covering for pills, or to give them consistence.

Dose and Mode of Administration.—*Extractum Glycirrhizæ,* D. L. E. ("Prepared as the simple extracts," D.—"As extract of gentian," L.—"Cut liquorice root into small chips, dry it thoroughly with a gentle heat, reduce it to a moderately fine powder, and proceed as for extract of gentian," E.). Extract of liquorice is imported in large quantities from Italy and Spain, in the form of flattened rolls, about 5 or 6 inches long, an inch in breadth, and half an inch in thickness, enveloped in bay leaves; in this state it generally contains a large quantity of copper acquired from the boilers in which it is prepared; it is, therefore, usually purified by dissolving in boiling water and inspissating, it then forms *stick or refined liquorice.* It is used as an emollient in coughs and bronchial affections, being allowed to dissolve slowly in the mouth.—*Decoctum Glycirrhizæ,* D. (Liquorice-root, bruised, ℥iss.; water, *by measure* ℔j.; boil for ten minutes and strain). Chiefly used as a vehicle for more active medicines. —*Trochisci Glycirrhizæ,* E. (Extract of liquorice; and gum arabic, of each, ʒvj.; pure sugar, ℔j.; dissolve them in a sufficiency of boiling water, and then concentrate the solution over the vapour bath to a proper consistence for making lozenges). For allaying tickling cough caused by irritation of the fauces.

Gossypium, E. *Raw Cotton. Hairs attached to the seeds of Gossypium herbaceum.* A native of Asia, and extensively cultivated in America; belonging to the Natural Family *Malvaceæ,* and to the Linnæan class and order *Monadelphia Polyandria.*

Botanical Characters.—Stem, 3 to 12 feet high; Leaves, hoary, palmate acutely lobed; Flowers, yellow, with a large purple spot at the base of each petal; Capsules, ovate, pointed, about the size of a walnut; Seeds, numerous, imbedded in down, which constitutes the cotton.

Physical Properties.—Cotton is in filamentous masses, each filament examined by the microscope is a flattened tube twisted on itself; it is of a pale yellowish-white colour, tasteless and destitute of smell.

Chemical Properties.—Cotton is a modification of *lignin;* it is highly combustible, and is completely insoluble in water, alcohol, ether, the fixed and volatile oils, and all the vegetable acids.

Therapeutical Effects.—The only medicinal use made of cotton is in the treatment of burns; it is applied in all stages, but the earlier the better; if any blisters be present, they should be first opened. The most convenient form for its application is that which is technically known as *French wadding,* and which is prepared for milliners; this should be applied in successive layers, the unstarched side next the burn, so as completely to exclude the air; it should not be removed for five or six days if possible, and then only the outer layers. Some surgeons, in extensive burns, use a spirituous or turpentine wash before applying the cotton.

Gummi acaciæ, E. Acacia, L. Acacia arabica et Acacia vera, gummi, D. *Gum of various species of Acacia,* E.—*of Acacia vera,* L.—*of Acacia arabica, and Acacia vera,* D.—*Gum-arabic; Gum acacia.*—The species of the genus Acacia which yield gum are inhabitants of Arabia, Egypt. and Senegal; they belong to the Natural family *Leguminosæ* (*Fabaceæ,* Lindley), and to the Linnæan class and order *Polygamia Monœcia.*

Botanical Characters.—Small thorny trees; Leaves, pinnated; Leaflets, linear, 8 to 20 pairs; Flowers, capitate, small, yellow.

Preparation.—Gum exudes from the trees either through natural fissures in the bark, or through artificial incisions made into it in the hot season of July and August; it flows in the form of a thick, viscid fluid, which concretes on the tree without losing its transparency; that which flows early in the season is gathered in December, and that which flows later, in March; the first gathering is considered the best.

Physical properties.—Several varieties of gum acacia are met with in commerce; the most commonly known are *Turkey, or true Gum Arabic, Barbary Gum, Senegal Gum, East India Gum, and Cape Gum.* Gum arabic occurs in tears or irregularly shaped pieces, varying in size from a pea to that of a chestnut; it is transparent and brittle, but not readily reducible to fine powder; it has a vitreous fracture, and a pale reddish-yellow or pure white colour. It is inodorous; and has a weak mucilaginous taste. Its Sp. gr. varies from 1·316 to 1·525. The most transparent and whitest

tears are picked out and sold as *picked gum*, or *gum of first quality*. The other varieties of gum do not differ essentially from gum arabic; they are usually in larger sized pieces, and of a darker colour; they are inferior in quality to gum arabic, and should not be used for medical purposes.

Chemical Properties.—Gum arabic consists of 79·4 per cent. of soluble gum *(arabin)*, 17·6 of water, and 3 of ashes. Some of the inferior sorts of gum contain a large quantity of insoluble gum *(bassorin)*. Its ultimate analysis is $C^{12}H^{11}O^{11}$. Gum is soluble in its own weight of cold or boiling water, forming a viscid solution *(mucilage)*; it is also soluble in vegetable acids; but is insoluble in alcohol, ether, and the fixed or volatile oils. By exposure to heat the water it contains is driven off; but it cannot be fused. Its solution in water reddens litmus paper faintly.

*Adulterations.*—The finer qualities of gum arabic are adulterated with the inferior, and these again with the other sorts; but the picked gum ought alone to be used in medicine.

Therapeutical Effects.—Gum is nutritive, emollient, and demulcent. It is employed in inflammation of the mucous membranes, in gastric irritation, in acrid poisoning, &c. Its chief uses are as a vehicle for more active medicines, for suspending insoluble substances in water, and as a basis for pills in extemporaneous prescriptions. A strong solution has been proposed by Mr. Rhind of Edinburgh, as an application to burns, and in some cases in which I tried it, the pain was much alleviated, and when applied immediately after the accident, the formation of blisters was prevented. Thick mucilage dropped into the eye removes the annoyance occasioned by the presence of fine sand or dust in that organ.

Dose and Mode of Administration.—In substance or powder, ʒss. to ʒi., allowed to dissolve slowly in the mouth, in irritation of the fauces and in tickling cough.—*Mucilago Gummi Arabici*, D. (Gum arabic, in coarse powder, ʒiv.; hot water, fʒiv.; digest, shaking frequently that the gum may be dissolved; then strain through linen).—*Mistura Acaciæ*, L. (Acacia, powdered, ʒx.; boiling water, Oj.; rub the gum with the water gradually poured in, and dissolve it).—*Mucilago*, E. (Gum arabic, ʒix.; cold water, Oj.; mix, dissolve without heat, but with occasional stirring, and strain through linen or calico). Mucilage made with cold water keeps best; the quantity of gum employed in the Dublin formula is too much by one-half. The following proportions of mucilage are required to render different substances miscible with aqueous vehicles, according to the observations of Dr. Montgomery; "*Oils* require about three-fourths of their weight, *balsams* and *spermaceti* equal parts, *resin* two parts, and *musk* five times its weight."—*Emulsio Arabica*, D. (Gum arabic, in powder, ʒij.; sweet almonds, blanched; white sugar, of each, ʒss.; water, *by measure* ℔j.; dissolve the gum in the water made hot, and as soon as the mixture is cold, pour it gradually on the almonds previously pounded with the sugar; rub them together till the liquor assumes the appearance of milk, and strain).—*Mistura Acaciæ*, E. (Mucilage, fʒiij.; sweet almonds, ʒx.; pure sugar, ʒv.; water, Oij.; blanch the almonds, beat

them to a smooth pulp in an earthenware or marble mortar, first with the sugar, and then with the mucilage; add the water gradually, stirring constantly; strain through linen or calico). Used for the same purposes as almond mixture, (see page 171).—*Trochisci Acaciæ*, E. (Gum arabic, ℥iv.; starch, ℥i.; pure sugar, ℔j.; mix, and pulverise them; and make into a proper mass with rose-water for forming lozenges). For cough, hoarseness, and irritation of the fauces.

Incompatibles.—Alcohol, and consequently all tinctures; ether; ammonia; acetate of lead; borax; and the mineral acids.

Hemidesmus Indicus. *Scented or Indian sarsaparilla.* The root of this plant has, within the last ten or twelve years, been employed in medicine in the British isles, under the name of *Smilax aspera*. It is a native of the Indian peninsula; and belongs to the Natural family *Asclepiadaceæ*.

**Botanical Characters.—Roots, long, cylindrical; Stems, twining, woody slender; Leaves, opposite, entire, glaucous, on short footstalks; Flowers, small, greenish-purple, in axillary racemes.**

Physical and Chemical Properties.—As usually met with, the roots are from 10 to 12 inches in length, and vary in thickness from that of a goose-quill to that of the little finger. They consist of a reddish-brown corrugated epidermis, a yellow inner bark, from a line to a line and a half thick, and a paler coloured woody centre or meditullium; the bark splits transversely into rings, between which the meditullium is seen. Indian sarsaparilla has a very agreeable odour resembling that of the *Tonquin bean*, and a sweetish mucilaginous taste. It has not been accurately analysed, but Mr. Garden of London obtained from it a volatile crystallizable acid, which he has named *smilasperic (hemidesmic?* Pereira) acid, and on which its fragrant odour depends. It imparts both odour and taste to boiling water.

Therapeutical Effects.—Although this root is highly esteemed in India as a diaphoretic and tonic, and is used there extensively as a substitute for sarsaparilla, it has been only employed in this country for preparing a demulcent syrup, which, chiefly in consequence of its agreeable flavour, is employed as a vehicle for more active medicines.

Dose and Mode of Administration.—An infusion, prepared by infusing ℥ij. of the root in a pint of water, is employed in India. The dose of it is from f℥ij. to f℥iv.—*Syrupus Hemidesmi*, Bell. (Root of hemidesmus Indicus, ℥xvj.; refined sugar, ℔j.; distilled water, Oiij.; bruise the root sufficiently to separate the bark by sifting and reject the wood; add to the bark an equal bulk of washed sand; moisten with water (three or four ounces), so as to insure its intimate mixture, and pack it well in a displacement apparatus, add as much water as it will absorb; macerate for four hours, and displace the liquor by the addition of a further portion of water; reserve the first six ounces; add more water till it passes through tasteless, then evaporate the latter portion to three ounces, in which, with the addition of the first six ounces, dissolve the sugar with as moderate a heat as possible). Dose, f℥i. to f℥ij.

Hordeum, L. E. Hordeum distichon, semina decorticata, D. *The seeds of Hordeum distichon freed from the husks. Pearl-barley.* A native of Tartary; now cultivated extensively in Europe; belonging to the Natural family *Graminaceæ*, and to the Linnæan class and order *Triandria Digynia.*

Botanical Characters.—Stem, 3 to 4 feet high, glaucous, furrowed; Leaves, alternate, lanceolate, acute; Flowers, terminal, in close spikes, with long serrated awns.

Preparation.—Pearl-barley is prepared in a mill of a peculiar construction, by which, after it has been deprived of its husk, it is rounded and polished.

Physical Properties.—It is in small spherical grains, white, smooth, still retaining a trace of the longitudinal furrow of the seed; it is odourless, but has a mild, sweetish, mucilaginous taste.

Chemical Properties.—Pearl barley is composed of fecula, uncrystallizable sugar, gum, gluten, albumen, lignin, &c. Proust has indicated the presence of a peculiar principle in barley meal which he has named *hordeïn*, but Dr. Thomas Thompson states, that it is merely a variety of *amylin*. Pearl-barley yields its mucilaginous principles to boiling water; the decoction contains much starch as shown by the action of iodine on it when cool.

Therapeutical Effects.—Pearl-barley is employed in medicine in the form of decoction, as an emollient and demulcent drink in febrile and inflammatory affections, as a vehicle for other remedies, and to give bulk to enemata.

Dose and Mode of Administration.—*Decoctum Hordei*, D. L. (Pearl-barley, ʒij. (ʒiiss., L.); water, *by measure* ℔vss. (Oivss., L.); first clean the barley with cold water; then boil for a short time with ℔ss. (Oss., L.) of the water; throw away the liquor; pour the remainder of the water boiling on the barley; and finally boil down to one-half and strain). *Decoctum Hordei compositum*, D.L. (Decoction of barley, *by measure* ℔iv. (Oij., L.); raisins, (stoned D.); figs, sliced, of each, ʒij. (ʒiiss., L.); liquorice root, sliced and bruised, ʒss. (ʒv., L.); "during the boiling, add the raisins first, then the figs, and lastly the liquorice a little before the conclusion of the boiling; which is completed when there remains only what will afford ℔ij. *by measure* of strained liquor," D.—"Add a pint of water, boil down to Oij. and strain," L.)—*Mistura Hordei*, E. (Pearl-barley; figs, sliced; and raisins, stoned, of each, ʒiiss.; liquorice root, sliced and bruised, ʒv.; water, Ovss.; clean the barley if necessary by washing it with cold water; boil it with Oivss. of the water down to Oij.; add the figs, raisins, and liquorice root with the rest of the water, boil down again to Oij.; then strain). These decoctions may be employed indiscriminately for the purposes above stated.

Lini semina, L. E. Linum usitatissimum, semina, D. *Linseed; The seeds of Linum usitatissimum.*

Lini oleum, D. L. E. *Linseed oil, obtained from the seed by expression.*

Lini farina, E. *Linseed meal, deprived of fixed oil by expression.*

The common flax, *Linum usitatissimum*, is an indigenous plant; belonging to the natural family *Linaceæ*, and to the Linnæan class and order *Pentandria Pentagynia*.

Botanical Characters.—Stem, a foot to a foot and a half high, slender, branched above; Leaves, distant; Flowers, large, purplish-blue; Capsule, globular, ten-seeded.

Preparation.—The seeds are threshed out of the plant when fully ripe; and the oil is obtained from them by pressure without heat.

Physical Properties.—The seeds are ovate, pointed, about a line in length, smooth and shining; they are reddish-brown externally, whitish within; they have an oily taste, but are inodorous. The oil is thick, of a wine-yellow colour, with a faint disagreeable odour, and a mild, somewhat nauseous taste. Sp. gr. ·932. As met with in commerce it is expressed with the aid of heat, when the colour is rather deeper. The seeds yield about 20 per cent of oil.

Chemical Properties.—The seeds consist of vegetable mucus containing free acetic acid and some salts, extractive, starch, wax, soft resin, gum, albumen, yellow colouring matter, and fixed oil, (*Meyer*). The mucilage exists in the tegument, the fixed oil in the nucleus. Linseed oil is composed of *oleic* and *margaric* acids, combined in equal equivalents with *acroleine*, (Sacc); it dissolves in 5 times its weight of boiling alcohol, in 40 times its weight of cold alcohol, and in about one part and a half of ether. At a temperature of—17° it congeals into a solid yellow mass; exposed to the air it concretes into a transparent varnish, and consequently is called in the arts, *a drying oil*.

Therapeutical Effects.—Linseed and its oil are emollient and demulcent. An infusion of the seeds is sometimes employed internally in dysentery and diarrhœa, and in bronchial affections; it is also used as an emollient enema. Externally, the seeds reduced to powder, *linseed-meal*, are employed to prepare poultices and cataplasms; the oil mixed with lime water is used as an application to recent burns.

Dose and Mode of Administration.—*Infusum Lini compositum*, D. L. *Infusum Lini*, E. (Linseed, (bruised, D. L.), ℥i. (℥vj., L. E.); liquorice root, sliced, ℥ss. (℥ij., L. E.); boiling water, *by measure* ℔ij. (Oj., L. E.); digest for four hours (near the fire, L. E.) in a covered vessel, and strain "through linen or calico," E.). *Linseed Tea*, the best form for internal use, it may be sweetened with honey which increases its emollient properties; Dose, f℥ij. to f℥iv.—*Linimentum Calcis*, D. E. (Lime water; and linseed oil, of each, f℥iij.; mix with brisk agitation). This compound is commonly known by the name of *Carron oil*; it is an excellent application to recent scalds and burns.—*Pulvis pro Cataplasmate*, D. (Linseed, which remains after the expression of the oil, one part; oatmeal, two parts; mix). Both the Dublin and Edinburgh Colleges erroneously direct linseed-meal for poultices to be deprived of its oil by expression, as the powder of unpressed linseed is much more mucilaginous.—*Cataplasma simplex*, D. (Powder for a cataplasm, any quantity; boiling water, sufficient to form a tepid cataplasm, to be smeared over with olive oil).—*Cataplasma Lini*, L. (Boiling water, Oj.; bruised linseed, sufficient to make it of a proper consistence).

Incompatibles.—Preparations of lead and iron, and probably most metallic salts are incompatible with infusion of linseed.

Malva, L. E. *Herb of Malva sylvestris; Common Mallow.* Indigenous; belonging to the Natural family *Malvaceæ*, and to the Linnæan class and order *Monadelphia Polyandria.*

Botanical Characters.—Root perennial, tapering; Stem, two to five feet high, branched; Leaves on long petioles, five to seven lobed; Flowers, large, three or four together, axillary, of a purplish-rose colour.

Preparation.—The herb should be gathered when in full flower.

Properties.—The entire plant is employed; it is odourless and insipid; every part of it abounds in mucilage, which it yields to boiling water. An infusion of the fresh flowers is an excellent chemical test for acids and alkalies, being changed to red by the former, and to green by the latter.

Therapeutical Effects.—A simple emollient: it is employed in the same cases as the other remedies of this class, but at present is not much used.

Dose and Mode of Administration.—*Decoctum Malvæ compositum*, L. (Mallow, dried, ʒi.; chamomile, dried, ʒss.; water, Oi.; boil for a quarter of an hour and strain). Dose, fʒiv. to fʒvj.; chiefly used for fomentations, and in enemas.

Maranta, L. E. *Fecula of the rootstalk (of the tubers, E.) of Maranta arundinacea*, L. E.—*and of Maranta Indica*, E. *Arrow-root. Maranta arundinacea* is a native of the West Indies, it is extensively cultivated in Jamaica; *Maranta Indica* is a native of the East Indies, and has been introduced into the Edinburgh Pharmacopœia, as it is supposed to yield some of the East Indian arrow-root. They belong to the Natural family *Marantaceæ*, and to the Linnæan class and order *Monandria Monogynia.*

Botanical Characters.—The rhizome is white, tuberous, and jointed, running horizontally in the ground, sending down many tuberous rootlets (*stoles*), about the thickness of a quill, covered with scales; Stem, 2 to 3 feet high; Leaves, ovate, lanceolate, alternate, with long, leafy, hairy, sheaths; Flowers, small, white.

Preparation.—Arrow-root is the fecula of the *stoles*; it is procured from them when they are twelve months old; they are then dug up, cleansed, and reduced to a state of pulp in wooden mortars; the pulp is agitated with water, the fibres removed with the hand, the milky liquor passed through a fine hair-sieve, and allowed to settle, when it deposits the arrow-root, which is again washed with cold water, and finally dried in the sun.

Physical Properties.—*West Indian Arrow-root*, which is the most prized, and which alone is officinal, is in the form of a very white powder, often aggregated into small irregular masses, crackling between the fingers, inodorous and tasteless. Examined by the microscope it is

seen, like the other varieties of fecula, to consist of small elliptical grains, varying in size from a 2000th to a 750th of an inch in their longest diameter.

Chemical Properties.—Its composition is $C^6H^5O^5$. In all other respects it resembles wheaten starch already described, but the jelly which it forms with boiling water is much more consistent; according to the observations of Hayne, with equal quantities of boiling water, the jelly formed by 9 parts of arrow-root is as firm as that formed by 14 of wheaten starch.

*Adulterations.*—A great many varieties of fecula, known in commerce as Brazilian arrow-root, East Indian arrow-root, &c. but especially that obtained from the potato, *potato-starch*, are commonly sold for the true West Indian arrow-root. The fraud is best detected by the microscope; the grains, of which the true arrow-root is composed, being much more minute than those of any of the other varieties.

Therapeutical Effects.—Arrow-root is rather an article of mild nutritious diet for the invalid than a medicine. It is particularly valuable in consequence of its emollient properties in diseases of the digestive organs; it is also an excellent nutriment for infants and young children.

Dose and Mode of Administration.—A table-spoonful is sufficient to form a stiff jelly with a pint of boiling water or milk; to prepare it for use, the arrow-root should be first blended with a small quantity of the fluid, the remainder then added, care being taken that it is boiling, and the whole then gently heated for a few minutes; it is usually flavoured with lemon-peel, sugar, &c. Arrow-root milk and arrow-root gruel are made like the corresponding preparations of sago, *(which see)*. A fecula obtained from the root of *Canna coccinea*, a native of the island of St. Kitts, has been recently introduced into Britain under the name of *Tous-les-mois;* it is fully equal to arrow-root as an article of diet, and is much cheaper.

Olivæ oleum. *Olive oil* (described in the division *Cathartics*), acts also as an emollient; internally it is only employed as such in cases of irritant poisoning; as an external agent it enters into the composition of emollient ointments, liniments, &c.—*Unguentum simplex*, E. (Olive oil, f℥vss.; white wax, ℥ij.; melt the wax in the oil, and stir the mixture briskly while it concretes in cooling). A mild dressing.

Ovum, L. E. *The egg of Phasianus Gallus, the domestic fowl. Phasianus Gallus* (Gallus domesticus, *Temminck*), belongs to the class *Aves*, order *Gallinæ*. Eggs are a mild and nutritious article of diet, and as such are frequently used in the sick-room. The white or *albumen*, is employed as an antidote in poisoning with corrosive sublimate, or with the salts of copper; it is also useful in all cases of irritant poisoning. The yolk is employed in pharmacy for suspending camphor, oils, resins, &c. in aqueous vehicles.

SACCHARUM COMMUNE, E. SACCHARUM OFFICINARUM, SUCCUS CONCRETUS NON PURIFICATUS, D. *Raw sugar; Muscovado.*

SACCHARUM, L. SACCHARUM PURUM, E. SACCHARUM OFFICINARUM, SUCCUS CONCRETUS PURIFICATUS, D. *Pure sugar; White or refined sugar.*

SYRUPUS EMPYREUMATICUS, D. SACCHARI FÆX, L. E. *Molasses; Treacle.* The sugar cane, *Saccharum officinarum,* is extensively cultivated in both the East and West Indies; it belongs to the Natural family *Graminaceæ,* and to the Linnæan class and order *Triandria Digynia.*

BOTANICAL CHARACTERS.—Stem, solid, juicy, from 6 to 12 feet high, coloured; Leaves, flat, in two rows, sheathing at the base; Flowers, triandrous, in a terminal panicle from 2 to 4 feet long, of a silver-grey colour from the long soft hairs that surround the flower.

PREPARATION.—The canes, when ripe, are cut off close to the ground, and the juice expressed from them by pressure between rollers; milk of lime is immediately added to the liquor, and the mixture gently heated, to saturate any acid present and to remove the herbaceous matter. The clear liquor is then drawn off, evaporated to a proper consistence in copper boilers, and allowed to cool in large wooden vessels, in which the impure sugar is deposited in coarse brown grains; this constitutes *raw sugar or muscovado.* The syrupy liquor, which does not crystallize, constitutes *molasses or treacle.* Raw sugar is refined in England; it is first dissolved in a small quantity of water by the aid of steam, heated for a short time with bullocks' blood, or with hydrate of alumina, which clarifies the syrup; it is then strained to remove the impurities, and filtered through a thick layer of animal charcoal; the clear liquor is next evaporated by steam heat in copper vessels placed in a partial vacuum, to a proper consistence, and poured into conical moulds; as soon as it becomes solid in the moulds, they are put to drain, and a solution of pure syrup, or a mixture of clay and water, poured over the base of each loaf; which, as it gradually percolates through the sugar, removes any impurities. These loaves constitute *loaf-sugar, refined sugar or pure sugar.*

PHYSICAL PROPERTIES.—The physical properties of the different varieties of sugar are too well known to need description. The specific gravity of crystallized white sugar is 1·6065.

CHEMICAL PROPERTIES.—Sugar is permanent in the air, exposed to heat it melts, becomes brown, and emits a peculiar odour; it is inflammable, burning with a white flame; it is soluble in two parts of water at 60°, and to any extent in boiling water; it is soluble in 80 parts of absolute alcohol at the boiling temperature, very slightly in the same when cold, and in about five parts of rectified spirit; it is much more soluble in proof spirit; it is wholly insoluble in ether, which precipitates it from its solutions. In the crystalline state, cane sugar is composed of $C^{12}$ $H^{11}$ $O^{11}$. Treacle consists principally of uncrystallizable sugar, gummy extractive, and a small quantity of water, which it retains with so great tenacity, that if left exposed to the air, even for a very long period, it does not become drier, or lose weight.

*Adulterations.*—The inferior raw sugars frequently contain sand, which is left when the sugar is dissolved in water; white sugar is said to be adulterated with lime and gum; the former is detected by oxalic acid, the latter by diacetate of lead, producing white precipitates in a solution. Raw cane sugar is in the present day commonly adulterated with grape

sugar, a fraud of much importance, in consequence of the inferior sweetening powers of the latter. That variety of it obtained from potatoes—*potato sugar*—is generally used for this purpose. It may be detected by the following simple but beautiful test of Trommer: "Dissolve the specimen in water, add sufficient solution of sulphate of copper, to colour the liquid blue, then a large excess of solution of caustic potash; the blue precipitate at first thrown down is re-dissolved with an intense purplish-blue colour by the excess of alkali. On heating the liquid now to the boiling point, if there be no grape sugar present, it undergoes but little change; but if it contain any of that article, a precipitate of brilliant red sub-oxide of copper is thrown down, copious in proportion to the quantity of grape-sugar present."

Therapeutical Effects.—Sugar is highly nutritious, but as an article of diet it is rather employed for its agreeable sweetness. As a medicine it is emollient and demulcent, and as such, is used in coughs, and in irritant poisoning. In pharmacy it is in very general use as a flavouring ingredient, and to give bulk and consistence to powders, pills, conserves, electuaries, lozenges, syrups, &c.

Dose and Mode of Administration.—*Syrupus*, L. *Syrupus simplex*, D. E. (Pure sugar, (in fine powder, D.), ℥xxix. (℔x. L. E.); water, *by measure* ℔j. (Oiij. L. E.); "add the sugar to the water gradually, and digest with a medium heat in a close vessel, frequently agitating until it is dissolved; then pour it off from the dregs if there be any," D. —" dissolve the sugar in the water with the aid of a gentle heat," L. E.). As a flavouring adjunct to mixtures, and to suspend insoluble substances in aqueous vehicles.

Sago, L. E.—*Fecula of the pith of Sagus Rumphii*, L. *Farina from the interior of the trunk of various Palmaceæ and species of Cycas*, E. *Sago*. Various species of the palm tribe have been ascertained as sources of the sago of commerce; the finest is procured from *Sagus lævis*, and *Sagus genuina*, trees which form immense forests on nearly all the Moluccas, and which are so rich in starch that a single tree is reckoned to yield from 600 to 800 lbs. of sago. Some is also obtained from the *Sagus Rumphii*, a native of Malacca and the Malay Islands, and from the *Saguerus Rumphii*, which inhabits the islands eastward to the Bay of Bengal. They are all lofty trees, belonging to the Natural family *Palmaceæ*, and to the Linnæan class and order *Monœcia Hexandria*.

Preparation.—The tree being cut down, the pith is removed, reduced to powder, and the fecula separated from the woody fibre by repeated washings with water over a hair-sieve; when the milky liquor, which passes through, is allowed to settle, it deposits the sago in the form of a fine powder, which is afterwards granulated by a process with which we are not acquainted.

Physical Properties.—Sago occurs in the form of a fine powder (*Sago Meal*), or in pearly grains (*Pearl Sago*); both sorts have a pinkish-yellow tint, a faint musty odour, but no taste. The grains of pearl sago vary in size from a pin's head to that of a pea; the small variety is most esteemed, the larger sort is known as *common* or *brown sago*.

Chemical Properties.—In its chemical properties, sago resembles the other varieties of starch; but it does not form so firm a jelly with water as arrow-root: as seen under the microscope, its globules are larger than those of arrow-root, but smaller than those of potato-starch.

Therapeutical Effects.—As an article of diet for the sick room, sago is much inferior to arrow-root or tapioca, consequently it is not much used in the present day. The jelly may be prepared with it in the same manner as with arrow-root. *Sago milk*, Thomson, (Sago, ℥i.; cold water, Oj.; soak the sago in the water for an hour, pour off the water, and add of new milk, Oiss.; and boil slowly until it is well incorporated). It may be flavoured with sugar, nutmeg, or cinnamon, or white wine, according to circumstances.—*Sago pudding*, Thomson, (Beat the yolks of two eggs and half an ounce of sugar together, and stir the mixture into a pint of sago milk).

Salep.—*The dried root of Orchis mascula;* an indigenous plant belonging to the Natural family *Orchidaceæ*, and the Linnæan class and order *Gynandria Monandria*.

By grinding the dried roots of this and of other species of the genera Orchis and Eulophia, a nutritious substance is procured, which, although highly esteemed by the ancients, is but little employed in the present day. It contains a large quantity of gum, insoluble in cold, but soluble in boiling water (*bassorin*), and a trace of fecula. A mucilage formed by boiling ℥ss. of it in a Oj. of water, forms a nutritious and useful article of diet for the sick.

Sambucus nigra.—The flowers or the leaves of the common elder (described in the division *Cathartics*), are used to prepare an emollient cooling ointment.—*Unguentum Sambuci*, D. (Fresh elder leaves, ℔iij.; prepared hog's lard, ℔iv.; prepared mutton suet, ℔ij.; make an ointment in the same manner as the savine ointment).—L. (Elder flowers; and lard, of each, ℔ij.; boil the elder flowers in the lard till they become crisp, and press through a linen cloth). The latter ointment, as having an agreeable perfume, should be preferred.

Tapioca, E.—*Fecula of the root of Janipha Manihot (Manihot utilissima*, Pohl). *Tapioca*. A native of Brazil; belonging to the Natural family *Euphorbiaceæ*, and to the Linnæan class and order *Monœcia Monadelphia*.

Botanical Characters.—Root, large, thick, juicy; Stem about 6 feet high; shrubby; Leaves, palmate, 5-7 parted; Flowers, axillary, racemose.

Preparation.—The root, which consists of woody fibre, a bland fecula, and a highly acrid, poisonous, milky juice, is reduced to a pulpy mass, washed and pressed on mat-sieves; the milky liquor, with the fecula suspended in it, passes through, and on settling deposits the fecula, which is repeatedly washed with water to free it from the poisonous juice; and finally dried on hot plates; the marc is afterwards dried on iron plates over a fire, when it constitutes *Cassava* bread.

Physical Properties.—Tapioca occurs in irregularly shaped, rugged fragments, about the size of a small nut; white with a pinkish hue, inodorous and tasteless. Like the other feculas as seen under the microscope, it consists of small globules very uniform in size, and being nearly as small as the smallest globules of arrow-root.

Chemical Properties.—It is similar to the other varieties of fecula, and is a very fine form of starch.

Therapeutical Effects.—Precisely similar to those of arrow-root; a jelly may be prepared in the same manner. Tapioca milk and Tapioca pudding are made in the same way as sago milk and sago pudding.

Tragacantha, L. E. Tragacantha gummi, D. *Gummy exudation from Astragalus verus,* L.—*and other species* E.—*Gum of Astragalus creticus,* D. Several species of the genus Astragalus yield gum-tragacanth; they are natives of Asia Minor, Persia, and of the island of Crete. They are placed in the natural family *Leguminosæ (Fabaceæ,* Lindley), and in the Linnæan class and order *Diadelphia Decandria.*

Botanical Characters.—The Astragalus verus, which yields the finest gum-tragacanth of English commerce, is a small shrub, from 3 to 4 feet high, with spiny branches, pinnatifid leaves, and yellow papilionaceous flowers.

Preparation.—Tragacanth flows from natural fissures in the bark, and concretes rapidly when exposed to the air; it flows only during the hot season and in the night time.

Physical Properties.—Gum-tragacanth occurs in broad, thin plates, of a white or citron yellow colour, semi-transparent, marked with concentric elevations. It is inodorous and tasteless, is hard and brittle, but with difficulty reduced to powder, unless heated to 100° or 120° F.

Chemical Properties.—It is composed of 57 per cent. of soluble gum *(adragantine or arabin),* and 43 per cent. of gum insoluble in cold but soluble in boiling water *(bassorin),* (Bucholz). Its ultimate analysis is $C^{10}$ $H^{10}$ $O^{10}$. Gum-tragacanth forms a thicker mucilage with water than gum arabic, "one part giving more viscosity to water than 25 parts of gum arabic," (Bucholz).

Therapeutical Effects.—Similar to those of gum-arabic, but not so generally employed.

Dose and Mode of Administration.—Powder, ℥ss. to ℥ij.—*Pulvis Tragacanthæ compositus,* L. E. (Tragacanth, bruised; gum arabic, bruised; and starch, of each, ℥iss.; pure sugar, ℥iij.; reduce the starch and sugar together to powder, add the tragacanth and gum arabic, and pulverise the mixture thoroughly). Generally used for administering calomel and other active and heavy powders to children; the dose as an emollient for adults, is ℥i. to ℥ij.—*Mucilago Gummi Tragacanthæ,* D. E. (Tragacanth, powdered, ℥ij.; (boiling, E.) water, f℥viij. (f℥ix. E.); macerate in a close vessel until the gum is dissolved (for 24 hours, and triturate to dissolve the gum, E.), and strain through linen). Used for the same purposes as mucilage of gum arabic.

Tussilago farfara, folia et flores, D. Tussilago, L. *The leaves and flowers,* D.—*whole herb,* L., *of Tussilago farfara; Coltsfoot.* Indigenous; belonging to the Natural family *Compositæ (Asteraceæ,* Lindley), and to the Linnæan class and order *Syngenesia Superflua.*

Botanical Characters.—Root, creeping; Leaves, large, cordate, downy beneath; Flowers, asteraceous, yellow, appearing before the leaves.

Properties.—The dried herb is odourless, but has a mucilaginous, slightly bitter taste. It is chiefly composed of mucilage and bitter extractive. It yields its properties to boiling water.

Therapeutical Effects.—Although coltsfoot was formerly highly esteemed as an emollient and demulcent in chronic bronchitis and in consumption, in the present day it is scarcely ever employed except in domestic practice. A decoction prepared by boiling ʒiss. of the dried plant in Oiss. of water down to Oj., may be given in doses of fʒij. or fʒiij. repeatedly.

Uva, L. Uvæ passæ, E. Vitis vinifera, fructus siccatus, D. *The dried fruit of Vitis vinifera, (with the stones taken out,* L.). *Raisins.* The grape vine is generally cultivated throughout the greater part of the globe; it belongs to the Natural family *Vitaceæ,* and to the Linnæan class and order *Pentandria Monogynia.*

Botanical Characters.—A hardy climbing shrub; Leaves, alternate, smooth, lobed; Flowers, very small, greenish, in pendant racemes opposite to the leaves; Fruit, a succulent globose berry, usually four-seeded.

Preparation.—To prepare raisins, grapes are generally merely dried in the sun, sometimes artificial heat is employed; and in many places the fruit is dipped in alkaline ley before being dried.

Physical Properties.—Raisins are too well known to require description; two sorts widely different in appearance and flavour are commonly met with; the common raisin *(Passulæ Majores),* which alone is officinal; and dried currants *(Passulæ Minores),* which are the product of a small variety of vine, an inhabitant of Greece, especially the neighbourhood of Corinth, and of the islands of Zante and Cephalonia.

Chemical Properties.—Raisins consist of uncrystallizable sugar *(grape sugar),* mucilage, extractive, bitartrate of potash, malic and citric acids, &c.

Therapeutical Effects.—Raisins are emollient, nutritive, and demulcent; they are only employed in medicine as flavouring adjuncts, for which purpose they form ingredients in many officinal preparations.

Verbascum thapsus, folia, D. *The leaves of Verbascum thapsus. Great Mullein.* An indigenous plant; belonging to the Natural family *Scrophulariaceæ,* and to the Linnæan class and order *Pentandria Monogynia.*

Mullein leaves, though still retained in the Dublin Pharmacopœia, are never used in the present day; they were formerly employed in the form of decoction as an emollient in chronic coughs. They are held by some to be feebly narcotic.

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# CHAPTER XII.

## EPISPASTICS.

(Vesicants; Rubefacients; Counter-irritants; Derivatives; Revulsives.)

Epispastics are substances which produce redness, inflammation, or vesication, when applied to the skin. They are employed in the practice of medicine principally with the intention of relieving or removing the diseased condition of some internal organ, by producing a new irritation or determination to the surface of the body, or to some remote part. Independently of this effect, however, blisters, which are the most important medicinal agents in this division, act also as general stimulants to the system, and as such, are frequently used with much benefit in the advanced stages of typhoid fevers, and in spasmodic affections arising from debility. This stimulant effect of blisters should be borne in mind, and consequently their application should be avoided in the very acute stages of inflammatory diseases, until the general excitement be previously subdued by antiphlogistic means. Epispastics are generally employed as near the seat of the disease as possible, unless when the intention is to produce a determination to some remote part of the body, as in the application of sinapisms to the feet in affections of the head. In the employment of any of the remedies contained in this class, in the diseases of infancy and childhood, it must be borne in mind that inflammation of the skin is much more readily produced in the young than in persons advanced in life, and consequently their effects must be carefully watched; this is more especially the case with reference to blisters (see page 194).

Ammoniæ causticæ aqua, D. Ammoniæ liquor fortior, L. Ammoniæ aqua fortior, E. *Stronger solution of ammonia.* (These preparations have been described in the divisions *Antacids* and *Caustics*). Applied to the surface of the body, the strong solution of ammonia produces redness and irritation, and if the application be long enough continued, it vesicates. Its only advantage as a blistering agent is that it operates speedily, on which account it is employed in inflammation suddenly attacking any of the abdominal viscera, as in retrocedent gout. In diseases of the urinary organs it should be preferred as a blistering agent to cantharides, in consequence of the irritant action of that substance on the kidneys. As a counter-irritant it is frequently used to relieve internal inflammations; and as a rubefacient, it is employed in muscular or neuralgic pains. An immediate blister may be readily produced by pouring eight or ten drops of concentrated solution of ammonia on a piece of lint, and applying it to the skin with moderate pressure.—*Linimentum Ammoniæ,* D. L. E. (Solution of ammonia (Dens. 960, E.), f℥ij. (f℥j. L. E.); olive oil, f℥ij.; mix, with agitation). This preparation, so generally known as a domestic remedy by the name of *hartshorn and oil,* is an excellent counter-irritant much employed in inflammatory sore throat; it is usually applied on a piece of flannel. By increasing the quantity of ammonia, it produces more powerful effects—*Linimentum Camphoræ compositum,* D. L. (Camphor ℥ij. (℥iiss. L.); solution of ammonia, f℥vj. (f℥viiss. L.); spirit of lavender, *by measure* ℔j. (Oj. L.); mix the solution of ammonia with the spirit, then let a pint distil from a glass retort with a slow fire; lastly, dissolve the camphor in it).—*Linimentum Ammoniæ compositum,* E. (Stronger aqua ammonia (Dens. ·880), f℥v.; tincture of camphor, f℥ij.; spirit of rosemary, f℥i.; mix well together; this liniment may be also made weaker for some purposes with f℥iij. of tincture of camphor and f℥ij. of spirit of rosemary). These preparations are used for the same purposes as the liniment of ammonia; they are cleaner, more agreeable, and more efficacious.—*Linimentum Ammoniæ sesquicarbonatis,* L. (Solution of sesquicarbonate of ammonia, f℥i.; olive oil, f℥iij.; shake together until they are well mixed). Its effects and uses are similar to those of *Linimentum Ammoniæ.*—*Ammoniacal blistering ointment,* Gondret. (Take of axunge, ℥i.; oil of sweet almonds, f℥ss.; melt together with a gentle heat; pour the mixture while still liquid into a wide-mouthed glass vessel; then add, water of caustic ammonia, f℥v.; and mix with constant agitation till cold). In preparing this ointment, particular care must be taken that the axunge be merely melted; if it be too fluid or too warm, some of the ammonia will be vaporised and the resulting ointment too weak. It may be kept unchanged for many months, in stoppered glass bottles in a cool place. It is applied by spreading it on the skin, and covering the part with a compress; it vesicates in about ten minutes.

Antimonii et potassæ tartras. *Tartar emetic* (described in the division *Diaphoretics*), applied by friction to the skin, produces a crop of pustules which ulcerate and discharge purulent matter, causing there-

by counter-irritant effects. With this intention, it is very frequently employed in various affections of the thoracic and abdominal viscera; in subacute inflammations of the brain or spinal cord and their membranes; in diseases of the joints; in muscular and neuralgic pains, &c. It is usually applied in the form of ointment or saturated solution; or from gr. v. to gr. x., may be sprinkled over the surface of any simple plaster, and left on until it produces the desired effect.—*Unguentum Tartari Emetici*, D. *Unguentum Autimonii Potassio-tartratis*, L. *Unguentum Antimoniale*, E. (Tartar emetic, in very fine powder, ʒi. (ℨi. L. E.); prepared hog's-lard, ʒi. (ℨiv. L. E.). The Dublin preparation is too weak, and consequently often fails to produce any effect. This ointment is employed by rubbing about half a drachm on the skin night and morning; in two or three days, pustules begin to appear, when the application of the ointment should be discontinued, as it sometimes gives rise to troublesome ulceration. The concentrated solution is applied by means of pledgets of linen soaked in it; its operation is more speedy than that of the ointment. Rollott has recently proposed a new method for producing counter-irritation with tartar emetic. He places a small quantity of it in very fine powder on a piece of glass, and makes it into a thick paste with a drop or two of oil or water. This he inserts with a lancet under the skin, in the same manner as vaccine matter, proportioning the number of punctures to the effect it is wished to produce.

Aqua fervens. Boiling water has been used to produce rapid and extensive vesication, as a means of rousing the system in narcotic poisoning; the difficulty of confining its action, the great pain caused by it, and the troublesome ulceration which it is apt to occasion, forbid its use except in extreme cases.

Artemisia chinensis *et* A. indica, D. At the time of the publication of the Dublin Pharmacopœia, it was generally believed that the Chinese prepared moxas from the leaves of the above plants, and according to Lindley, it is the leaves of the former that they employ for this purpose. It is a small shrub, a native of China, belonging to the Natural family *Compositæ* (*Asteraceæ*, Lindley), and to the Linnæan class and order *Syngenesia Superflua*.

Preparation.—Moxas are prepared in China and Japan, from whence we have derived the use of them, by pounding the downy covering of the leaves until it resembles fine cotton, and rolling into small conical masses. In this country they are prepared either from the pith of the stem of the *Helianthus annuus*, the common sun-flower; or by soaking cotton-wool in a concentrated solution of nitre; and forming into small masses of the same shape as the Chinese moxas. More recently Professor Osborne of this city has proposed the use of fresh burned quick-lime, as a substitute for the common moxa, (*Dublin Journal*, Vol xx. p. 409). On the continent a piece of linen soaked in a concentrated solution of acetate of lead, dried and rolled into the proper shape, is usually preferred in the present day. A conical-shaped piece of camphor also forms an excellent moxa.

Effects and Uses. The first sensation felt on the application of a moxa is rather agreeable, but it soon causes intolerable pain, which, however, does not last long. Redness and inflammation of the part to which it is applied are produced, and an eschar formed immediately under the spot on which it has been placed, which extends to a considerable depth if the moxa be kept long in contact with the skin. The eschar separates in from eight to ten days, the process of inflammation set up for its discharge being attended with more or less suppuration, according to circumstances; and a discharge of purulent matter may be established after the separation of the eschar by the application of irritating unguents or by the insertion of issue peas. Moxas differ from the actual cautery in, that their effects are produced more slowly, and that the inflammation caused by them penetrates more deeply. The principal diseases in which the application of moxas has been found beneficial, are, in Pott's curvature of the spine, in inveterate sciatica, in neuralgia, in paraplegia, in chronic inflammation of the joints, in amaurosis, &c. The good effects produced by moxas depend on the principle of counter-irritation. Their use is contra-indicated in all acute inflammatory diseases.

Mode of Employment. The apex is set on fire and the base kept firmly applied to the skin by means of a piece of wire or a pair of forceps; the neighbouring parts should be covered with wet pieces of linen to protect them from the sparks; the combustion may be quickened by the blow-pipe or with the breath. Professor Osborne applies the quick-lime moxa as follows:—"Some quick-lime in powder to the depth of about half an inch, is placed on the skin inside a *porte moxa*, or a strip of card bent together and tied so as to form a circle; some water is dropped on and mixed with it. The ordinary lime from a lime-kiln answers well if fresh." Moxas should be applied as close to the seat of the disease as possible; Baron Larrey considers that their application to the following parts of the body is improper:—To the head where the skull is covered with skin and pericranium only; to the eyelids, nose, ears, larynx, trachea, sternum, glandular parts of the breast, linea alba, over the course of superficial tendons, articular prominences, where there is danger of injuring the articular capsules, and projecting points of bone. To these we may add, immediately over the course of large arteries, veins or nerves.

Cantharides (described in the division *Diuretics*), are employed externally to produce rubefaction, vesication, or suppuration. The first of these effects is caused by the application of cantharides mixed with other substances to blunt their activity, as in the *Emplastrum calefaciens*, D., or by applying the active preparations for only a short space of time. To produce rubefaction we employ cantharides in the treatment of rheumatic and other local pains, in chronic catarrh, and in the habitual cough of the old and debilitated. When cantharides are left for some time closely applied to the surface of the skin, the cuticle is raised and serous fluid effused between it and the true skin, a blister being thus produced in a period varying with the preparation of the flies which is employed. No

agent is so generally used to produce vesication as cantharides in consequence of the certainty of their operation, the comparatively little pain which they occasion, and the facility with which they may be applied. Blisters are employed in a great variety of diseases, generally with the intention of relieving pain, inflammation, and congestion of internal organs; which they effect by derivation to the surface of the body, or as it is usually termed by counter-irritation. With this view, they are applied in both the acute and chronic forms of inflammation of the brain and spinal cord, to the scalp, or along the track of the spinal marrow; in inflammatory affections of the thoracic and abdominal viscera, to the surface of the chest or abdomen; and in the local congestions of fevers, as near the affected part as possible. Blisters are also used to stimulate to increased action, as in indolent buboes, in chronic enlargement of the testicle, over chronic abscesses, to indolent ulcers, and in effusion into the joints. To excite the system generally, they are applied in the comatose stages of typhoid fever or pestilential cholera, and in apoplectic affections. To produce suppuration, cantharides are used in the form of ointment, as a dressing to parts from which the cuticle has been previously removed; and as powerful counter-irritants, are thus employed with much advantage in chronic inflammatory diseases, forming what is termed a perpetual blister. Cantharides should not be employed to produce vesication where any irritation or inflammation of the urinary organs is present, in consequence of their peculiar tendency to produce strangury. In infants and young children, blisters should be used with great caution, as they are liable to produce troublesome sloughing, which in many instances has caused death. As a general rule they should only be left on until redness of the surface is produced, when the application of a warm poultice to the part will cause vesication.

Pharmaceutical Preparations.—*Emplastrum Cantharidis*, D.—"Cantharides, in very fine powder; yellow wax, of each, ℔j.; yellow resin, ℥iv.; mutton suet; hog's lard, of each, ℔ss.; melt the wax, fats and resin together; and when they are just becoming stiff by cooling, sprinkle in the cantharides, and mix so as to form a plaster." L.—"Cantharides, in very fine powder, ℔j.; wax plaster, ℔iss.; lard, ℔ss.; sprinkle the cantharides in the plaster and lard melted together, and removed from the fire, a little before they concrete, and mix them all." E.—"Cantharides, in very fine powder; wax; resin; and suet, of each, ℥ij; liquefy the fats, remove from the heat, sprinkle in the cantharides, and stir briskly as the mixture concretes on cooling." This is the preparation most generally employed to produce a blister; it is spread on leather with a cold (*not heated*) spatula, and the margin covered with adhesive plaster to prevent its moving or falling off; blistering plaster, however, acts much better when spread on soft brown paper in a thin layer, in consequence of its being much more easily and more perfectly kept in close contact with the skin, which is effected by means of a bandage. In ordering blisters in prescriptions, it is usual to draw an outline with the pen of the size and shape which it is wished that they should be; but in some of the continental pharmacopœias, as in that of Hamburgh, prescribed forms are given for them. In order to prevent the irritant action of the cantharides on the urinary organs, in persons liable to such an effect, a piece of tissue paper oiled should be placed between the plaster and the skin. Blisters are usually left on from eight to twelve hours to produce their action; the raised cuticle should be then cut to allow the escape of the serum, and a dressing of spermaceti or some simple ointment applied.—*Emplastrum Calefaciens*, D. (Plaster of cantharides,

1 part; burgundy pitch, 7 parts; melt with a medium heat; and mix, so as to make a plaster). Rubefacient; its uses have been described above.—*Acetum Cantharidis*, L. E. ("Cantharides, in powder, ℥ij.; acetic acid, Oj.; macerate for 8 days, frequently shaking; press, and strain," L.—"Cantharides, in powder, ℥iij.; acetic acid, f℥v.; pyroligneous acid (dens. 1034), f℥xv.; euphorbium, in coarse powder, ℥ss.; mix the acids, add the powders, macerate for 7 days, strain and express strongly, and filter the liquor," E.). Employed as an extemporaneous blister; it may be conveniently applied with a piece of sponge, it produces a blister in from 5 to 10 minutes; complaints are frequently made of the inefficiency of this preparation; this arises either from its being prepared with weak acid, or from its not being rubbed into the skin with sufficient care, as its application should be continued until it produces intense redness of the part and much pain.—*Ceratum Cantharidis*, L. *Unguentum Cantharidis*, E. (Cantharides, in very fine powder, ℥i.; spermaceti cerate (resinous ointment, E.), ℥vj. (℥vij., E.); add the cantharides to the cerate (or ointment) softened by heat, and mix). Used to promote suppuration from blistered surfaces, but it is very apt to cause strangury.—*Unguentum Cantharidis*, D. L. (Cantharides, in very fine powder, ℥ij. (℥i., L.); distilled water, *by measure*, ℥viij. (f℥iv., L.); ointment of white resin (cerate of resin, L.), ℥viij. (℥iv., L.), boil down the water with the cantharides to half, and strain; mix the cerate with the strained liquor, then evaporate to a proper consistence).—*Unguentum Infusi Cantharidis*, E. (Cantharides, in moderately fine powder; resin; and wax, of each, ℥i.; Venice turpentine; and axunge, of each, ℥ij; boiling water, f℥v.; infuse the cantharides in the water for a night, squeeze strongly, filter the liquid, add the axunge, and boil till the water is dispersed; add the wax and resin; and when these have melted, remove the vessel from the fire, add the turpentine, and mix the whole thoroughly). Used for the same purposes as the cerate, than which these preparations are somewhat milder.—*Emplastrum Cantharidis compositum*, E. (Venice turpentine, ℥ivss.; Burgundy pitch; and cantharides, of each, ℥iij.; wax, ℥i.; verdigris, ℥ss.; white mustard seed; and black pepper, of each, ℥ij.; melt the wax, and Burgundy pitch, add the turpentine, and while the mixture is hot sprinkle into it the remaining articles previously in fine powder and mixed together; stir the whole briskly as it concretes in cooling). A more certain blister than the simple *emplastrum cantharidis*, according to Duncan it is *infallible*.—*Blistering cloth*, P. (Oil of cantharides obtained by ether, 4 parts; yellow wax, 8 parts; melt with a very gentle heat, and spread on waxed linen or calico). A more elegant preparation than blistering plaster, and equally, if not more efficacious.—*Tela vesicatoria; Charta vesicatoria*, &c.; so generally employed in the present day for blistering, are prepared in the same manner, paper being used instead of linen or calico.—*Papier d'Albespeyrres*, now so generally used for keeping up a discharge from blistered surfaces are prepared as follows:—No. 1. which is the weakest; "White wax, 5 parts; olive oil, 3 parts; oil of chocolate, 4 parts; spermaceti, 3 parts; turpentine, 1 part; cantharides, 1 part; water, 8 parts; all melted together."—No. 2. "White wax, $3\frac{3}{4}$; olive oil, $2\frac{1}{4}$; oil of chocolate, 3; spermaceti, $2\frac{1}{4}$; turpentine, $\frac{3}{4}$; cantharides, 1; water, 8."—No. 3. the strongest, contains the same quantities of cantharides and water, and half the proportions of the other ingredients contained in No. 1. The compound is spread on paper, or on fine linen or calico.

CAPSICUM ANNUUM, CAPSULÆ CUM SEMINIBUS, D. CAPSICUM, L. E. *The fruit of Capsicum annuum,—and of other species of Capsicum*, E. *Capsicum, or Chillies. Cayenne pepper.* The Capsicum annuum is a native of the East and West Indies, and of South America; it belongs to the Natural family *Solanaceæ*, and to the Linnæan class and order *Pentandria Monogynia*.

Botanical Characters.—A herbaceous annual, 1-2 feet high; Leaves, ovate, smooth, placed on long footstalks in irregular order; Flowers, white, axillary, solitary; Fruit, a long conical, juiceless, scarlet or yellow berry, pendulous.

Preparation.—Cayenne pepper is prepared by reducing to a moderately fine powder, the dried fruit of this and of other species. It is often imported in powder, chiefly from the West Indies, in small gourds; but the greater part is ground at home, a fourth part of common salt being generally mixed with it.

Physical Properties.—A moderately fine powder, of a reddish-yellow colour; with a faint aromatic odour, and a bitter, acrid, burning taste.

Chemical Properties.—The active principles of Cayenne pepper depend on a very acrid oil which has been named *Capsicin*. It yields its virtues to water, alcohol, ether, acetic acid, and the fixed and volatile oils.

Therapeutical Effects.—Cayenne pepper applied to the skin produces redness and inflammation, which is followed by vesication, if the application be continued for some time. As a rubefaciant, and even vesicant, it is much employed in the West Indies, but is scarcely ever used with either of these intentions in this country, nevertheless applied in the form of cataplasm, it is a convenient and effectual counter-irritant. Its use as a stimulant will be considered under that head.

Crotonis tiglii oleum, *Croton oil* (described in the division *Cathartics*), rubbed on the skin produces redness and inflammation of the part to which it is applied, which is followed by a copious pustular eruption. It is applicable to all cases in which we wish to produce speedy and active counter-irritation, but it should not be applied to the face or scalp, as in more than one instance I have seen it produce erysipelatous inflammation of these parts. Lafargue cures nævi by inoculation with croton oil; five or six punctures are made on and around the tumour with a lancet dipped in the oil, just as in vaccination. Each puncture immediately causes a pimple, which in 36 hours is developed into a little boil: these boils unite and form a hot painful tumour, covered with white crusts. Two days afterwards the scabs separate, and in lieu of the nævus is seen an ulcer which is to be treated on general principles. It would be dangerous to make more than six punctures on a very young infant, as the irritation and fever are considerable.—To prepare a liniment of croton oil, one part may be rubbed up with seven of olive oil, a combination sufficiently powerful for general employment; in hospital or dispensary practice, linseed oil may be used instead of olive oil. A plaster, prepared by melting with a gentle heat, four parts of diachylon plaster, and incorporating with it one part of croton oil, spread on calico, and applied to the surface of the body, will produce a pustular eruption in about 24 hours. It is a convenient and excellent way of employing this counter-irritant.

Euphorbia, L. E.—Euphorbia canariensis, gummi resina, D. *Gum-resin of Euphorbia officinarum*, L.—*of Euphorbia Canariensis*, D. —*Concrete resinous juice of undetermined species of Euphorbia*, E. *Euphorbium*. In Africa Euphorbium is procured from *Euphorbia officinarum* and from *Euphorbia antiquorum;* in the Canaries it is obtained from *Euphorbia canariensis*. The genus belongs to the Natural family *Euphorbiaceæ*, and to the Linnæan class and order *Monœcia Monandria*.

Botanical Characters.—The pieces of the branches which we find mixed with the gum are 4 to 5 angled, with dark, shining spines, double. The genus is characterised by its monœcious heads of flowers surrounded by an involucrum of one leaf with five divisions, including several barren flowers with one fertile; Capsule 3-seeded.

Preparation.—It is obtained in the neighbourhood of Mogadore, (from whence it is chiefly brought to this country), by making incisions into the stem and branches, from which a milky juice exudes; this juice concretes on the tree into a yellow gum, and is gathered when quite dry. So intensely acrid is the gum, that those who gather it are obliged to tie a cloth over their mouth and nostrils.

Physical Properties.—Euphorbium is in tears or small irregular masses, roundish, and angular, somewhat friable; they are of a dull, yellow colour, and pierced with small holes, formed by the spine of the branch on which they concrete. They have a weak odour, but a very acrid and burning taste; the powder snuffed into the nostrils produces much irritation, with incessant sneezing.

Chemical Properties.—It consists principally of resin the active ingredient, with wax, some caoutchouc, and salts of lime and potash. The resin is soluble in alcohol, but water has no action on it. Euphorbium melts when exposed to heat, is inflammable, and burns with a bright flame, and rather agreeable odour.

Therapeutical Effects.—Applied to the surface of the skin it causes much irritation, but does not vesicate or produce any eruption; if the cuticle, however, have been previously removed, its application causes a purulent discharge. It may, therefore, be employed with much advantage mixed with lard as an issue ointment, or for keeping up a discharge from blistered surfaces, being cheap and certain in its effects. For an issue ointment, 25 to 30 grains may be rubbed up with an ounce of lard, and the strength may be increased or diminished according to circumstances. It possesses the advantage over the preparations of cantharides, that it does not irritate the urinary organs, and over savine ointment that it does not spoil by keeping. The facility with which we can increase or reduce its strength is also of great importance.

Ipecacuanha (described in the division *Emetics*), is an excellent counter-irritant, though sometimes uncertain in its action; applied in the form of liniment, prepared as directed below, it produces an eruption of minute vesicles on an inflamed base in from 36 to 48 hours, which fade away in 3 or 4 days. It possesses the advantage of not causing much pain or constitutional irritation.—*Linimentum Ipecacuanhæ*, (Ipecacuan, in very fine powder, ℥ss.; axunge, ʒij.; olive oil, f℥iss.; mix). A fourth part of this should be rubbed well into the part it is desired to irritate, three or four times a day.

Mezereum. *Mezereon,* (described in the division *Diaphoretics).* The inner bark of the stem and branches is much employed on the Continent as a vesicatory, but as in the dry state its effects are uncertain and slowly produced, it is not used in this country as such. In France, in order to produce a blister with this substance, a piece of the bark is softened in warm water or in vinegar, and applied to the part with a compress and roller; at first the bark is renewed night and morning, but when the blister is produced it is changed only once daily. An issue ointment is also prepared with it, by digesting for 12 hours the sliced bark in axunge and white wax liquefied together, and straining.

Ranunculus acris, folia, D. Ranunculus flammula, herba recens, D. *The leaves of Ranunculus acris, and the fresh herb of Ranunculus flammula.* Indigenous; belonging to the Natural family *Ranunculaceæ,* and to the Linnæan class and order *Polyandria Polygynia.*

Several species of the genus Ranunculus possess vesicating properties in the recent state, but when dried, they are completely inert. They were formerly used as epispastics, and although the two species above mentioned are still retained in the Dublin Pharmacopœia, they are never employed in the present day in regular practice.

Ruta graveolens, (described in the division *Antispasmodics).* The fresh leaves may be employed as a local stimulant and rubefacient.

Sabina.—*Savin* (described in the division *Emmenagogues)* acts as a powerful local irritant. It is very generally employed in the form of ointment or cerate for keeping up the discharge from a blistered surface, producing what is termed a *perpetual blister.* Owing, however, to the difficulty in preparing the ointment well, and to its losing its properties by long keeping, an ointment prepared with euphorbium (see page 197) should be preferred for that purpose; one part of powdered savin combined with two parts of finely powdered alum, forms an excellent application to venereal vegetations: it is sprinkled over the part, and the application renewed twice daily; simple dressing being applied in the interval.

Pharmaceutical Preparations.—*Unguentum Sabinæ,* D. *Ceratum Sabinæ,* L. E. (Savin (fresh, E., fresh leaves stripped from their stalks, D.) bruised, ℔ss. (℔i. L. 2 parts, E.); prepared lard, ℔ij. (4 parts, E.); bees' wax, ℔ss. (1 part, E.); "boil the leaves in the fat until they become crisp; strain with expression; then add the wax, and liquefy together," D. "Boil the savin in the lard and wax melted together, (until the leaves become crisp, E.); and press through a linen (or calico, E.) cloth," L. E.). When well prepared this ointment is of a fine green colour, and has the peculiar odour of savin well marked.

Setons and Issues are employed to produce derivation from some internal organ, by causing a discharge of pus from the surface of the body, as in deep-seated local inflammations; and to establish a drain from the system in many diseases. With the former intention they are employed in ophthalmia, in chronic inflammation of the ear, in diseases of the brain and spinal marrow, in caries of the vertebræ, in chronic articular inflammation, in white swelling, in hip-joint disease, &c. With the latter, in apoplexy, epilepsy, chorea, spasmodic asthma, phthisis, hepatitis, &c. When setons or issues are employed in local affections, they should be applied as near the seat of the disease as practicable; but when used in general diseases, they may be inserted in whatever part of the body is most convenient; thus, setons may be inserted into the nape of the neck, and issues in the inside of the leg or arm.—The introduction of a seton is easily effected with a seton needle, an instrument shaped like a lancet, about 3 inches long, 3-8ths of an inch broad, slightly curved, and having an eye in the handle; a fold of the integuments being held up, the needle is forced through, and by its means a skein of silk, or a piece of India-rubber tape sufficient to fill the aperture, introduced through the wound; a fresh portion of the silk or India-rubber is drawn through the aperture daily, and if it does not produce sufficient irritation, it is smeared with some irritating ointment. Issues are more employed at present than setons; the manner in which they are inserted has been explained before, (see page 123).

Sinapis. *Mustard* (described in the division *Emetics)*, applied to the surface of the body acts as a local irritant, producing inflammation attended with much pain; and if the application be long continued, vesication with even ulceration and gangrene. It is very generally employed in the form of cataplasm, or as it is technically called *sinapism*, to produce counter-irritation: applied to the soles of the feet or calves of the legs, in the low state of typhus fever, especially when stupor or delirium is present, in apoplexy and coma, in narcotic poisoning and in other cases in which there is determination to the head. It is also often applied to the chest with much benefit in many pulmonary and cardiac diseases, and to the surface of the abdomen in painter's colic and other affections of the abdominal viscera.—*Cataplasma Sinapis*, D.L. (Mustard-seed; and linseed, each powdered, ℔ss.; boiling vinegar, sufficient to make a cataplasm. "Which may be made more stimulating by adding ʒij. of scrapings of horse-radish root," D.). This is a bad form for preparing sinapisms, as vinegar lessens the activity of the mustard; a better plan is simply to mix common table mustard with luke-warm water, and spread the paste on a piece of linen. Sinapisms produce inflammation in from fifteen to twenty minutes after they are applied; the length of time which they should be left on, may be regulated by the feelings of the patient; but if he be insensible, they should be removed as soon as the skin is reddened.

Succini oleum. *Oil of Amber,* (described in the division *Antispasmodics,)* is an active rubefacient, producing irritation and slight inflammation of the skin when applied with friction. It is sometimes employed in chronic rheumatism and paralysis; but its most general use is as a local application in hooping cough, in the following form, commonly known as *Roche's embrocation:*—Oil of amber, ʒiij.; oil of cloves, ʒi.; olive oil, ℥i.; mix.

Terebinthinæ oleum. *Oil of Turpentine* (described in the division *Anthelmintics),* is a speedy and effectual rubefacient, producing active inflammation, succeeded by a crop of small pimples, and sometimes minute blisters, when applied to the surface of the body. If it be applied warm it acts more quickly and more powerfully. As a counter-irritant, it is very generally and very beneficially employed in inflammatory attacks of the thoracic or abdominal viscera, in colic and peritonitis, in sore throat, in chronic rheumatism, in neuralgia, &c.—*Linimentum Terebinthinæ,* D. L. E. ("Ointment of white resin, ℔j.; oil of turpentine, ℔ss.; gradually mix the turpentine with the melted ointment," D. —"Soft soap, ℥ij.; camphor, ʒi.; oil of turpentine, f℥xvj.; shake them together until they are mixed," L.—"Oil of turpentine, f℥v.; resinous ointment, ℥iv.; camphor, ʒss.; melt the ointment and gradually mix with the oil and camphor till a uniform liniment be formed," E.). This liniment is powerfully stimulating; it was first proposed by Kentish as an immediate dressing for extensive burns, particularly when the vital powers were sinking; and for this purpose it is employed with much advantage; the parts are first smeared with oil of turpentine, and pledgets of lint covered with this liniment are then applied. It is also used as a counter-irritant, applied with friction in rheumatic and neuralgic pains.—*St. John Long's liniment.* (The yolk of one egg; oil of turpentine, f℥iss.; strong acetic acid, f℥i; pure water, f℥iij.; first rub the yolk of egg, the water, and the acetic acid together, then add the oil of turpentine, and agitate the whole until they are well mixed;—or, oil of turpentine, and distilled vinegar, of each, equal parts; yolk of egg, sufficient to make a uniform emulsion.) This excellent counter-irritant liniment is applied by means of a sponge; its effects vary with the force which is used in rubbing, and with the length of time the application is continued; the principal objection to its use is its very disagreeable smell, which may be somewhat obviated, and its rubefacient powers at the same time rather increased by the addition of a drachm of oil of rosemary.

# CHAPTER XIII.

## ERRHINES.

(Sternutatories, Ptarmics).

Errhines are substances which when applied directly to the lining membrane of the nostrils, cause an increased discharge of its natural secretion. Their medicinal employment is very limited, and in the present day they are seldom resorted to in regular practice. Their remediate powers depend on the derivation which they occasion from the surrounding or neighbouring parts, by the increased secretion from, and consequent afflux of blood to the nasal membrane. Snuffed into the nostrils so as to occasion sneezing, they may be employed to excite respiration when this function is suspended, or to promote the expulsion of foreign bodies lodged in the air passages; their use for these purposes, however, is not unattended with danger.

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Asarum europæum, folia, D. Asarum, L. *Leaves of Asarum europæum. Asarabacca.* An indigenous plant; belonging to the Natural family *Aristolochiaceæ,* and to the Linnæan class and order *Dodecandria Monogynia.*

Botanical Characters.—Stem very short; Leaves, 2, reniform, petioled, shining; Flower, solitary, from the axil of the two leaves, large, drooping, of a greenish-brown colour and coriaceous substance, upon a short footstalk.

Physical Properties.—Although the leaves only are officinal, the whole plant is kept in the shops; it has a faint, spicy odour, and a bitter, very acrid taste. The root is the most active part of the plant.

Chemical Properties.—The only important constituent of the leaves is a peculiar principle which has been named *asarin;* the root contains also an odorous volatile oil, and a very acrid fixed oil.

Therapeutical Effects.—Asarabacca was formerly employed as a cathartic, diuretic, and emetic, and is used as such even in the present day on many parts of the continent; in this country it is now only used as an errhine to produce a discharge of mucus from the pituitary membrane in head-ache, in chronic ophthalmia, in coryza, &c.

Mode of Administration.—Three or four grains of the powdered leaves may be snuffed up into the nostrils night and morning, or the same quantity of the following preparation may be used.—*Pulvis Asari compositus,* D. (Asarabacca leaves, dried, ℥i.; lavender flowers, dried, ℥i.; reduce them together to powder).

Euphorbium, (described in the division *Epispastics*), operates as a powerful errhine, but its action is so violent, even when diluted with any bland powder, that in the present day it is scarcely ever employed as such.

Hydrargyri oxydum sulphuricum, D. *Subsulphate of mercury; Turbith mineral.*

Preparation.—"Persulphate of mercury, 1 part; warm water, 20 parts; triturate together in an earthen-ware mortar, and pour off the supernatant liquor; wash the yellow powder with warm distilled water, till the decanted fluid is no longer precipitated on the addition of a few drops of solution of caustic potash; lastly, dry the sulphuric oxide of mercury, which remains."

Physical Properties.—A dense, lemon-yellow powder; void of odour, but having a somewhat acrid, metallic taste.

Chemical Properties.—It is composed of one eq. of sulphate of mercury, and two of oxide of mercury, (Kane). It is permanent in the air; exposed to heat it acquires a reddish-brown colour, but on cooling it resumes its former yellow hue. It requires 2000 parts of cold, or 600 of boiling water for its solution.

Therapeutical Effects.—This preparation was formerly employed as an emetic, but is now only used as an errhine, to produce a discharge from the nostrils in chronic ophthalmia, incipient hydrocephalus, cephalalgia, &c. One grain mixed with four or five of some bland powder, as liquorice or starch, is snuffed up the nostrils at bed time or in the morning.

Veratrum album, radix, D. Veratrum, L. E. *Root (Rhizome, E.) of Veratrum album. White hellebore.* A native of the mountainous regions of central and Southern Europe; belonging to the Natural family *Melanthaceæ,* and to the Linnæan class and order *Polygamia Monœcia.*

Botanical Characters.—Rhizome, fleshy, cylindrical, giving origin to numerous undivided radicles; Stem, 1-4 feet high; Leaves, sheathing, plaited, ovato-oblong; Flowers, greenish-yellow, in a large spreading panicle.

Physical Properties.—As usually met with in the shops, white hellebore root consists of the rhizome with the radicles attached: it is in pieces of from two to three inches long, about the thickness of the little finger; covered with a rough, dark brown bark; greyish-white internally. In the fresh state, it has a strong, disagreeable smell, which is nearly lost by drying; but it retains the acrid, intensely bitter taste.

Chemical Properties.—It is composed of a fatty matter, yellow colouring matter, starch, gum, lignin, and an alkaloid on which its acridity depends and which has been named *veratria* (see *Stimulants*), combined with gallic acid, (*Pelletier and Caventou*). More recently Simon has announced the discovery of two new vegetable alkaloids in white hellebore root, one of which he has called *Jervin,* and the other *Barytin.* The acridity of the root is extracted both by water and by alcohol.

Therapeutical Effects.—The local action of white hellebore root is powerfully irritant. Snuffed up the nostrils it produces a copious flow of mucus, with much sneezing. It may be used as an errhine in the same cases as the other remedies of this class. Two or three grains of the root, finely powdered and mixed with ten or twelve grains of powdered liquorice-root, orris-root, or starch, may be employed every evening. It enters into the composition of most cephalic snuffs.

# CHAPTER XIV.

## EXPECTORANTS.

(Pectorals).

Expectorants may be defined, medicines which promote the secretion from the bronchial tubes and air passages, and facilitate its discharge. There are no substances, which, by a direct or *specific* action on the lungs, produce expectoration; those medicines which are employed with this intention act relatively, that is to say, they operate through the medium of the system generally, relieving or removing that state of disease which demands the use of expectorants. Consequently, most agents which are used under this name are derived from other divisions of medicinal substances; and there are none more uncertain in their effects. There are two modes in which the medicines employed to promote expectoration appear to act; first, by removing constriction of the pulmonary exhalent vessels, on which principle the nauseating expectorants appear to produce their effects; or secondly, by stimulating these vessels, they either increase the natural exhalation where it is deficient, or alter its character where it is in an unhealthy state. To these we may add all emetic substances, which by their mechanical action, dislodge accumulated secretions from the respiratory organs, and thus frequently become most valuable agents in the treatment of many diseases, which demand the use of expectorants.

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### Acidum benzoïcum, D. L. E. *Benzoïc acid. Flowers of Benjamin.*

Preparation.—*Dub.*—"Benzoïn, 5 parts; recently burnt lime; and muriatic acid, of each, 1 part; water, 200 parts; rub the benzoïn with the lime, boil for half an hour in 130 parts of water, constantly stirring; let the vessel rest and pour off the liquor when cold; boil the remainder in 70 parts of water, and again pour off the liquor when cold; boil the mixed liquors to one half, filter through paper, and add gradually the muriatic acid to the liquor when cold; lastly, the liquor being poured off, wash the powder with a small quantity of cold water, dry with a gentle heat, and sublime the benzoïc acid in a proper vessel with a slow fire." *Lond. Edin.*—"Benzoïn, ℔j. (any convenient quantity, E.); put it into a proper vessel (a glass matrass, E.); and with a gradually raised heat (from a sand-bath, L.), sublime as long as anything rises; press that which is sublimed between folds of blotting paper to remove the oil from it, and sublime it again."

Physical Properties.—In the form of soft, elastic, pearl-white, satiny crystals or scales; having a faint aromatic odour, and an acid, penetrating taste. Sp. gr. 0·667.

Chemical Properties.—Its composition is $C^{14}H^5O^3$, combined in the crystalline state with one eq. of water. It is permanent in the air; at a temperature of 248° it fuses, and at 293° sublimes; heated in the open air it produces an acrid white vapour which irritates the fauces; it is very inflammable, and burns with a fuliginous flame, leaving no residue. Benzoïc acid requires 200 parts of cold water, or 12 of boiling water for its solution; it dissolves in 2 parts of cold alcohol or ether, and in a less quantity of acetic acid or oil of turpentine. It possesses the usual characteristics of a weak acid.

*Adulterations.*—It is not liable to adulteration, but is often badly prepared; when good it is colourless, entirely sublimed by a gentle heat, and completely soluble in solution of potash or lime water.

Therapeutical Effects.—Although formerly highly esteemed as a stimulating expectorant in chronic bronchitis, in the present day it is scarcely ever employed, except in the *Tinctura opii camphorata*, D. E. *Tinctura camphoræ composita*, L. and the *Tinctura opii ammoniata*, E. in both of which preparations it is an ingredient.*

Dose and Mode of Administration.—Gr. v. to gr. xxx.; it should be dissolved in a large quantity of water, as otherwise it is apt to irritate the fauces: its solubility is much increased by giving it with phosphate or biborate of soda.

Incompatibles.—Alkalies, and their carbonates; metallic salts, &c.

Antimonii et potassæ tartras. *Tartar emetic* (described in the division *Diaphoretics*), administered in small doses, from 1-16th to 1-10th of a grain frequently repeated, operates as an expectorant, but its effects as such are more certainly manifested, if it be given so as to produce nausea. It is best adapted for *acute* attacks of inflammation of the lungs or bronchial membrane.

Balsamum peruvianum, L. E. Myroxylum peruvianum, balsamum, D. *Balsam of Peru; Liquid balsam of Myroxylon Peruiferum* L.—*of Myroxylum Peruvianum*, D.—*Fluid balsamic exudation of*

* Dr. Ure, of London, a few years ago called the attention of the profession to the chemical change which takes place in the composition of the urine when benzoïc acid is taken into the stomach: namely, the conversion of the insoluble *uric acid* and its salts into the soluble *hippuric acid* and *hippurates*. He therefore proposed its employment in all cases, accompanied with increased secretion of uric acid, as in gout, rheumatism, and calculous disorders. In a case of uric acid gravel, in which I employed benzoïc acid, the deposit in the urine apparently ceased, while the use of the acid was continued; but returned to a greater extent than before when its administration was stopped. From the recent experiments of Keller, Booth, Boyé, and others, it has been shown that although benzoïc acid is converted into hippuric acid in the system, and excreted by the kidneys in this form, the secretion of uric acid is not affected either in regard to its quantity or chemical properties by it; from which it results that benzoïc acid cannot be looked upon as a remedy for uric acid diseases.

*Myrospermum Peruiferum*, E. A native of the forests of Peru, New Granada, and Columbia; belonging to the Natural family *Leguminosæ (Fabaceæ*, Lindley), and to the Linnæan class and order *Decandria Monogynia*.

Botanical Characters.—A lofty, handsome, branching tree, with a smooth, thick, very resinous bark; Leaves alternate, pinnated, consisting of eleven leaflets, which are ovate, blunt, and downy on their midrib and petiole; Flowers white, in axillary racemes; Fruit, a legume.

Preparation.—It is procured in two ways; the finest, which is not met with in British commerce, by incisions made into the bark of the tree; the second, by boiling the young branches, and the bark of the trunk in water; many pharmacologists, however, doubt that any of it is procured by the latter method.

Physical Properties.—Balsam of Peru, as it occurs in English commerce, is a thick, semi-transparent, heavy liquid, of a dark reddish-brown colour. It has an agreeable aromatic odour, and a warm, bitterish taste. Sp. gr. about 1·160.

Chemical Properties.—According to the analysis of Fremy, it is composed of an oily matter which he has named *cinnameïne*, of *cinnamomic* acid *(Benzoïc* acid of previous chemists), and one or more resins. Exposed to the air it becomes more dense, but does not dry up; it is inflammable, burning with a bright flame and much smoke, and diffusing a very agreeable odour. It is insoluble in cold water, but water boiled with it acquires its agreeable odour; it is soluble in alcohol in all proportions, but it is only partially dissolved by ether.

*Adulterations.*—It is said to be adulterated with alcohol; this fraud is known by its low density, and by its losing volume when mixed with cold water.

Therapeutical Effects.—Balsam of Peru is a mildly stimulating expectorant, and as such was at one time much employed in chronic bronchitis, in the advanced stages of phthisis, and in old asthmatic cases; it has, however, completely fallen into disuse, as an internal remedy.

Dose and Mode of Administration.—Min. xx. to min. xl., suspended in aqueous vehicles, by means of mucilage or yolk of egg.

Balsamum tolutanum, L. E. Toluifera balsamum, resina, D. *Balsam of Tolu; Concrete balsamic exudation of Toluifera balsamum*, D.—*of Myroxylon Peruiferum*, L.—*of Myrospermum Toluiferum*, E. Although the London College on the authority of Ruiz, refers the balsams of Tolu and of Peru to the same tree, more recent observation has shown that they are from distinct species. The Myrospermum Toluiferum is a native of the mountainous districts of Tolu, Turbaco, and the neighbourhood of the river Magdalena; it belongs to the Natural family *Leguminosæ (Fabaceæ*, Lindley), and to the Linnæan class and order *Decandria Monogynia*.

Botanical Characters.—Precisely similar to M. Peruiferum, except the leaves, which are oblong, acuminated, and smooth upon the petiole and midrib.

Preparation.—It exudes in the liquid state from incisions made into the bark of the tree, but it soon concretes on exposure to the air.

Physical Properties.—In solid masses of a resinous appearance, and a reddish yellow colour. It has a peculiar fragrant odour, more agreeable than the balsam of Peru, and a sweet aromatic taste.

Chemical Properties.—Its composition is the same as that of the balsam of Peru. It becomes more solid by exposure to the air, it melts by heat, and is inflammable, burning with a fuliginous flame, and a very agreeable odour. It is soluble in alcohol and ether, and boiling water dissolves out its fragrant acid.

Therapeutical Effects.—It is a stimulating expectorant, and in consequence of its agreeable flavour, is very much used as an adjunct to pectoral mixtures; but it should not be employed when there is any inflammatory action present.

Dose and Mode of Administration.—Gr. x. to gr. xxx.; it is best administered suspended in aqueous vehicles by means of mucilage or yolk of egg.—*Tinctura Balsami Tolutani*, D. L. *Tinctura Tolutana*, E. (Tolu balsam, ℥i. (℥ij. L., ℥iiiss. E.); rectified spirit, *by measure* ℔j. (Oij. L. E.); digest (in a close vessel, D. with a gentle heat, E.), until the balsam is dissolved, and filter). Dose, f℥i. to f℥ij.; it is precipitated when added to water, but it may be suspended in water by means of mucilage or syrup.—*Syrupus Balsami Tolutani*, D. *Syrupus Tolutanus*, L. E. ("Tincture of balsam of Tolu, ℥i.; simple syrup, ℔iss. (℔ij. E.); to the syrup recently made and not altogether cooled, add the tincture by degrees, agitating briskly," D. E.—"Balsam of Tolu, ℥x.; boiling water, Oj.; sugar, ℔iiss.; boil the balsam in the water for half an hour in a vessel lightly covered, frequently stirring, and strain the cooled liquor; then add the sugar and dissolve it," L.). Dose, f℥ii. to f℥ss., merely used as a flavouring adjunct. Tolu lozenges prepared with the syrup and sufficient gum, are a popular and useful remedy in chronic coughs.

Benzoïnum, L. E. Styrax benzoïn, resina, D. *Benzoïn. The balsam*, L.—*The resin*, D.—*Concrete balsamic exudation*, E.—*of Styrax benzoïn.* A native of Sumatra, Borneo, and Java; belonging to the Natural family *Ebenaceæ (Styracaceæ*, Lindley), and to the Linnæan class and order *Decandria Monogynia.*

Botanical Characters.—A tall tree with rounded branches, and a whitish bark; Leaves entire, pointed, tomentose beneath; Flowers, in compound axillary racemes.

Preparation.—The balsamic exudation is procured by making incisions into the bark of the tree, and allowing the liquid which exudes to concrete on the stem; when it is quite hard it is removed, and fresh incisions made, by which an inferior quality is obtained.

Physical Properties.—Benzoïn occurs in large masses of a reddish-brown colour externally, with a waxy, somewhat shining fracture, presenting many whitish amygdaloid tears cemented together by a reddish substance; the inferior qualities contain but few tears and are of a more

uniform reddish-brown colour all through. The French pharmaceutists describe another variety in tears of a pale yellow colour, but it is not met with in the English market. Benzoïn has an agreeable aromatic odour, and a sweet balsamic taste; the odour and taste of the inferior qualities are much less agreeable. Sp. gr. about 1·065

Chemical Properties.—It is composed of about 28 per cent of resin soluble in ether, 50 of resin insoluble in ether, and about 14 of benzoïc acid, with a trace of volatile oil, aromatic extract, &c., (Kopp). It is permanent in the air, heated it fuses and benzoïc acid is sublimed; it is inflammable, burning with a fuliginous flame and an agreeable odour. It is partly soluble in alcohol, ether, and acetic acid; boiling water dissolves out the benzoïc acid.

Therapeutical Effects.—Benzoïn is a stimulating expectorant, formerly much used in chronic cough, in old cases of bronchitis, and in the advanced stages of phthisis; in the present day it is not much employed. Like the other stimulating expectorants, it is inadmissible in inflammatory cases.

Dose and Mode of Administration.—It is not used in the solid state.—*Tinctura Benzoïni (Benzoës,* D.) *composita,* D. L. E. ("Benzoin, ℥iii. (℥iiiss. L.); purified storax, ℥ii. (℥iiss. L.); balsam of Tolu, ℥i. (3x. L.); Socotorine aloes, ʒss. (3v. L.); rectified spirit, *by measure,* ℔ii. (Oij. L.); macerate for 7 (14 L.) days and strain;" D. L.—"Benzoin, in coarse powder, ℥iv; Peru balsam, ℥iiss.; East Indian aloes, ʒss.; rectified spirit, Oij.; digest for 7 days, pour off the clear liquor and filter it," E.) A stimulating expectorant; Dose, f3ss. to f3ij., as an adjunct to pectoral mixtures; it is precipitated by water, but may be mixed with water by means of mucilage, yolk of egg or syrup. This tincture was formerly much employed as an application to wounds and contusions, under the name of *Friar's Balsam.*

Ipecacuanha (described in the division *Emetics*), administered in small but frequently repeated doses, a fourth of a grain to half a grain, acts as an expectorant, but its effects as such, are much more surely manifested if nausea be at the same time produced. In some cases of chronic inflammation of the bronchial mucous membrane accompanied with profuse secretion, it operates beneficially, not by promoting expectoration, but by diminishing the discharge, and by some specific action restoring the parts to a healthy state. In acute or inflammatory diseases of the lungs or bronchial tubes, ipecacuanha to prove beneficial must be given in doses sufficient to produce nausea or even vomiting; but in chronic affections of the same parts, more advantage will be derived from smaller doses. As an expectorant, the doses of Ipecacuanha and its preparations are as follows:—In *powder,* gr. ¼th. to gr. ij.—*Vinum Ipecacuanhæ,* D. L. E., Min x. to min. xl.—*Syrupus Ipecacuanhæ,* E., f3i. to f3ij.—*Pilulæ Ipecacuanhæ compositæ,* L. (Compound powder of ipecacuanha, ℥iij.; squill, fresh dried; and ammoniacum, of each, ℥i.; mixture of acacia, q. s.; beat together till they are incorporated). A useful stimulating expectorant in habitual cough affecting the old and debilitated. Dose, gr. v., three or four times a day. Every five grains contain about a fourth of a grain each of ipecacuan and opium.

Lobelia, L. E. *Lobelia. Indian tobacco. The herb of Lobelia inflata.* A native of the United States, where it is a very common weed growing on road sides and in neglected fields; it belongs to the Natural family *Lobeliaceæ,* and to the Linnæan class and order *Pentandria Monogynia.*

Botanical Characters.—Annual, 1-2 feet high, with a branching stem; Leaves, scattered, alternate, oblong; Flowers, pale blue, in terminal racemes; Capsules, ovoid, inflated.

Preparation.—The entire herb is collected in the end of August, as soon as the capsules are formed, and carefully dried. It is imported from America compressed into rectangular masses, being prepared for exportation by the Shaking Quakers of New Lebanon in the State of New York.

Physical Properties.—Its odour is faint but disagreeable, and the taste at first insipid, but when chewed, very acrid, and resembling that of tobacco, causing, like it, a flow of saliva and a nauseating effect on the stomach.

Chemical Properties.—According to the analysis of Mr. Procter, lobelia contains an acrid volatile oil, a peculiar alkaline principle named *Lobelina,* lobelic acid, gum, resin, fixed oil, chlorophylle, extractive, and various salts. *Lobelina* appears to be the active principle, the whole plant yields but one part in five hundred of it, but the seeds alone contain twice as much; the active principles of lobelia are soluble in water, alcohol, and ether.

Therapeutical Effects.—Lobelia was employed by the native Indians of North America as an emetic, but its action as such, is highly irritating and attended with much danger, for if it fail to excite vomiting soon after it has been taken, it produces all the symptoms of a powerful narcotico-acrid poison, and so small a quantity as a teaspoonful of the powdered leaves has proved fatal in some instances. In small doses, however, it is a most valuable sedative expectorant, apparently possessing a specific power in allaying spasm of the bronchial tubes. It is therefore employed with most benefit in paroxysmal diseases of the lungs, as in asthma and hooping cough; it has also proved serviceable in the obstinate cough of chronic bronchitis, and in the latter stages of croup.

Dose and Mode of Administration.—Lobelia is seldom given in the form of powder, the dose, as an expectorant, is from gr. j. to gr. v. *Tinctura Lobeliæ,* E. (Dried lobelia, in moderately fine powder, ℥v.; proof spirit, Oij.; this tincture is best prepared by the process of percolation as directed for tincture of capsicum, but it may be also made in the usual way of digestion). Dose, f℥ss. to f℥i.; larger doses are apt to prove emetic.—*Tinctura Lobeliæ Ætherea,* E. (Dried lobelia, in moderately fine powder, ℥v.; spirit of sulphuric ether, Oij.; best prepared by percolation as directed for tincture of capsicum; but it may be also obtained by digestion, in a well closed vessel for 7 days). Dose, min. xx. to min. xl. The latter preparation is usually preferred in asthmatic cases, in consequence of the sedative properties of the sulphuric ether.—*Whitlaw's ethereal tincture of lobelia.* (Dried lobelia, ℔j.; rectified spirit, Oiv.; spirit of nitric ether, Oiv.; spirit of sulphuric ether, ℥iv.;

macerate for 14 days in a dark place, and filter). This is the preparation of lobelia most generally employed in this country; Dose, min. v. to min. xx.

Marrubium vulgare, D. L. *White Horehound.* An indigenous plant growing in waste places and by road sides, belonging to the Natural family *Labiatæ* (*Lamiaceæ*, Lindley), and to the Linnæan class and order *Didynamia Gymnospermia.*

Botanical Characters.—About a foot and a half high, every where hoary with a white thick pubescence or woolliness; Flowers, small, white, in crowded whorls.

Properties.—The whole plant has a peculiar aromatic odour, and a very bitter balsamic taste. Its properties depend on volatile oil and extractive, it also contains tannic acid; it yields its virtues to boiling water and to alcohol.

Therapeutical Effects.—White horehound was long held in high estimation as a tonic expectorant. In the present day it is commonly employed as a domestic remedy in chronic coughs; but it is scarcely ever used in regular practice. It is generally given in the form of infusion, *Horehound tea,* prepared by infusing ʒi. of the herb in Oj. of boiling water for an hour, of which the dose is fʒiij. or fʒiv., sweetened with sugar; or in the form of confection, *Candied Horehound,* prepared by evaporating a strong syrup of the herb to dryness; a small bit of which is allowed to dissolve in the mouth frequently.

Incompatibles.—The sesquisalts of iron; ipecacuanha and tartar emetic.

Scilla. *Squill* (described in the division *Diuretics),* in small doses frequently repeated, promotes the secretion of the bronchial mucous membrane; it is not, however, a stimulating expectorant as is generally stated, and may therefore be prescribed in the acute and subacute stages of pulmonary affections as well as in the chronic. It proves more serviceable in the bronchitis and pneumonia of children, than in the same diseases in adults. From the property which squill possesses of promoting the secretion of mucus, it facilitates expectoration in some forms of asthma and chronic bronchitis in which the sputa are viscid; in these cases it is advantageously combined with the more stimulating remedies of this class. The dose of powdered squill as an expectorant should not exceed gr. j., frequently repeated. The oxymel or syrup is one of the most useful expectorants we possess for the pulmonary affections of children, in doses of min. x. to min. xxx. The tincture is employed as an adjunct to pectoral mixtures in chronic bronchial affections; Dose, min. x. to min. xxx.—*Pilulæ Scillæ compositæ,* D. L. (Squill, fresh dried and powdered, ʒj.; ginger, powdered, ʒiij. (ʒij. L.); ammoniacum, powdered, ʒij; hard soap, ʒiij.; mix the powders together, add the soap, and with sufficient treacle (syrup, L.),

beat to a proper consistence).—*Pilulæ Scillæ*, E. (Squill, in fine powder, 5 parts; ammoniac; ginger, in fine powder; and Spanish soap, of each, 4 parts; conserve of red roses, 2 parts; mix the powders, add the other articles, beat them into a uniform mass, and divide it into five-grain pills). Dose, gr. v. to gr. xv. in chronic catarrh and asthma. It spoils by keeping.—*Syrupus Scillæ compositus*, U. S. (Squill, bruised; seneka, bruised, of each, ℥iv.; tartar emetic, gr. xlviij.; water, Oiv.; sugar, ℔iiiss.; pour the water on the squill and seneka, boil to one-half and strain; add the sugar, evaporate the whole to Oiij., and while hot dissolve in it the tartar emetic). An excellent formula, particularly adapted for croup and chronic bronchitis in children: dose for adults f℥i. to f℥ii., for children, min. v. to min. xv.

Senega, L. E. Polygala senega, radix, D. *Seneka. Snake root. Root of Polygala senega.* A native of the United States; belonging to the Natural family *Polygalaceæ*, and to the Linnæan class and order *Diadelphia Octandria.*

**Botanical Characters.**—Root, perennial; Stems numerous, annual, from nine inches to a foot high; Leaves, sessile, ovato-lanceolate; Flowers, small, white, in spiked racemes; Capsule, small, elliptical, containing two small black seeds.

Physical Properties.—Root varying in size from the thickness of a writing pen to that of the little finger, contorted, knotty, marked with slight eminences on one side; cortical portion, resinous, greyish or yellowish externally, whitish internally; central portion (*meditullium*), whitish, woody, inert. The root has a faint, peculiar odour, and a taste at first mucilaginous, afterwards nauseous and acrid.

Chemical Properties.—It is composed of tannic and pectic acids, wax, fixed oil, gum, albumen, colouring matter, lignin, some salts, and a peculiar acrid principle, which, according to Quevenne, consists of two volatile acids, named by him *Polygalic* and *Virgineïc* acids, the former of which appears to be the active principle of the plant. It yields its properties to both water and to alcohol; according to some recent observations, it appears that by the continued action of boiling water on the root, part of the active principle is formed into an insoluble compound with the colouring matter and albumen; therefore the Edinburgh College has substituted an infusion for the decoction of the other Pharmacopœias.

Therapeutical Effects.—Seneka root is a stimulating expectorant of much power, peculiarly fitted for the advanced stages of chronic bronchitis and of pneumonia, especially when occurring in the aged and debilitated. It is also a very valuable remedy in protracted hooping cough, and in the latter stages of croup and of bronchitis in infants and children.

Dose and Mode of Administration.—In powder, gr. x. to ℥ss.; this is the best form for the administration of seneka, in the pulmonary affections of children.—*Decoctum Senegæ*, D. L. (Seneka, ℥iij. (℥x. L.); water (distilled, L.), ℔iss. (Oij. L.); boil down to ℥viij. (Oj. L.), and

strain). Not so good a form as the infusion for the reasons above stated.—*Infusum Senegæ*, E. (Seneka, 3x.; boiling water, Oj.; infuse for four hours in a covered vessel and strain). An excellent vehicle for other remedies in old cases of catarrh and bronchitis. Dose, f℥ij. to f℥iij.

Styrax, L. E. Styrax officinale, resina, D. *Storax. Resin*, D.—*Balsamic exudation*, L. E.—*of Styrax officinale.* A native of the Levant, Palestine, Arabia, and cultivated in the South of Europe; it belongs to the Natural family *Ebenaceæ (Styracaceæ*, Lindley), and to the Linnæan class and order *Decandria Monogynia.*

Botanical Characters.—Stem from 15 to 25 feet high, branching at the top; Leaves, alternate, ovate, villous beneath; Flowers, white, in small racemes; Fruit, a coriaceous capsule, downy, one-seeded.

Preparation.—The process followed for obtaining storax from the tree is not accurately known, but it is supposed to be procured from incisions made into the tree, or from the punctures of insects.

Physical Properties.—A great many varieties of storax have been described by pharmacologists; two are most generally met with.—1. *Liquid storax;* of this I have met with two sorts; one a greyish substance of the consistence of bird-lime, with a strong odour having some resemblance to that of impure naphtha, acquiring a dirty brown colour on exposure to the air; the other, a shining black, very viscid liquid, becoming more fluid when heated, with a very agreeable, aromatic odour; both sorts have a pungent balsamic taste.—2. *Common storax;* this is in very friable reddish-brown masses, with an agreeable, aromatic odour, and a warm, somewhat acrid taste; it appears to be saw-dust cemented together by some liquid resin.

Chemical Properties.—The medicinal virtues of storax depend on the presence of volatile oil, benzoic acid, and resinous extractive. It yields its active properties to alcohol, but merely its fragrancy to boiling water.

*Adulterations.*—No accurate account could be given of the adulterations of storax, so many different substances are sold under that name. The grey liquid storax is manifestly some compound of impure naphtha.

Therapeutical Effects.—Formerly employed as an expectorant in the same cases as benzoïn; in the present day it is only used as an ingredient in the *Pilulæ Styracis* (see Opium), to conceal the odour and taste of opium.

Pharmaceutical Preparations.—*Styrax colatus*, L. *Extractum Styracis*, E. (Dissolve storax in (by boiling in successive quantities of, E.) rectified spirit, and strain; distil off the spirit, and evaporate with a gentle heat (over the vapour bath, E.) to a proper consistence, L. the consistence of a thin extract, E.). Only used in the above preparation.

# CHAPTER XV.

## NARCOTICS.

(Anodynes; Hypnotics; Soporifics).

Narcotics may be defined, medicines which produce a primary stimulating effect on the nervous and vascular systems, but which is rapidly followed by a depression of the vital powers and sleep, or if a large quantity of the substance be swallowed, by coma. The primary stage, that of excitement, varies much both as to the degree in which it is produced and as to its duration; depending chiefly, on the manner in which the narcotic is administered, on idiosyncracy, and on habit. In large doses, the stage of excitement is so short, and the depression of vital power so immediate, that it has led many to deny altogether the stimulant property of narcotics, and to regard them as producing direct sedative effects on the system. An attentive consideration, however, of the *modus operandi* of the medicinal agents described in this chapter, and a comparison of them with those which are contained in the chapter on Sedatives, must, I think, satisfactorily prove that their operation is perfectly different. Indeed, some narcotics, as opium, are frequently administered with the intention of producing a stimulant action only. When given with this intention, the doses should be small, but frequently repeated in order to sustain the state of excitement; but when administered with the view of producing sleep, the doses should be larger, and repeated at more distant intervals. Idiosyncracy has a remarkable influence on the effects of narcotics; we meet with some individuals almost insensible to their action; while in others, small doses produce a dangerous stupifying effect, or in some instances give rise to a degree of excitement amounting to furious delirium. But habit influences the action of narcotics on the system more than any other circumstance, their power being diminished in an extraordinary degree by repetition; where therefore their continued administration is required, it will be necessary gradually to augment the dose, in order to produce their usual effects. The influence of age on their action must be also borne in mind in their administration; the young being much more susceptible to their influence than individuals of mature age.

Belladonna, L. E. Atropa belladonna, folia et radix, D. *Leaves (and root, D.) of Atropa belladonna. Deadly nightshade.* An indigenous plant; belonging to the Natural family *Solanaceæ*, and to the Linnæan class and order *Pentandria Monogynia.*

Botanical Characters.—Root, fleshy, creeping; Stems 3-4 feet high, herbaceous; Leaves, ovate, acute, entire, smooth, some very large, but placed in pairs of unequal sizes; Flowers, axillary, on short peduncles, drooping, lurid purple, about an inch long; Berries, shining, black, about the size of a black cherry, filled with a sweetish pulp in which are imbedded many kidney-shaped seeds.

Preparation.—The root, which is contained only in the *Dublin Pharmacopœia*, is scarcely ever used at present; it should be dug up in the month of March, and dried quickly. The leaves are gathered in June and July before the flowers expand, and dried with a stove heat.

Physical Properties.—Belladonna root is from one to two inches in diameter, and a foot or more in length; it is of a grayish-white colour internally, grayish-yellow externally; it has a faint nauseous odour, and a slightly astringent bitter taste. The leaves when fresh are of a sombre-green colour, which becomes yellowish-green in drying; they have a feeble odour, and a herbaceous, somewhat nauseous taste.

Chemical Properties.—The medicinal properties of belladonna depend on a peculiar principle which has been named *atropia;* it was first discovered by M. Brandes in the leaves, in which he found it to exist in combination with malic acid, two nitrogenous extractive matters called by him *pseudotoxin* and *phytocolla*, gum, wax, chlorophylle, starch, albumen, lignin, salts, &c. Atropia when obtained quite pure is in white transparent prismatic crystals, of a silky lustre. It is without odour but possesses a nauseously bitter, acrid taste; it requires for its solution 500 parts of cold water, the solution having a bitter taste and an alkaline reaction; but is very soluble in alcohol and ether; it combines with acids to form salts. The composition of atropia according to Liebig, is $C^{34}$ $H^{23}$ $O^{6}$ N. Belladonna leaves and root yield their active principles to both water and alcohol.

*Adulterations.*—The leaves of the *Solanum nigrum* are sometimes sold for those of the atropa belladonna; the former are smaller, obtuse angled, not acuminated, and they are bluntly toothed; by which characters they may be readily distinguished.

Therapeutical Effects.—Belladonna acts on the system as a powerful narcotic, in large doses proving an active poison, causing constriction of the throat with ineffectual efforts to vomit, delirium usually of a gay or mirthful character, with excessive dilatation of the pupils, then coma which is followed by death unless active treatment be immediately employed. In medicinal doses it operates as an anodyne and calmative, diminishing pain and over-excitement of the nervous system; with this intention it has been employed in most neuralgic and convulsive diseases, but for some years back it is not so much used as it formerly was. It has been generally stated that belladonna should not be employed in acute inflammations or febrile affections, but more recent observations have shewn that a state of inflammation in the system does not contra-indicate its use. The diseases in the treatment of which belladonna is

found most beneficial are the varieties of neuralgia, and spasmodic and painful affections; thus it has been found most useful in tic douloureux, in all forms of external neuralgic pains, in nervous palpitations, in hooping cough, in spasmodic stricture of the urethra, in painful spasm of the *sphincter ani* when there is no fissure of the part, in dysmennorhœa, in orchitis after the acute stage has subsided, in painful glandular enlargements, in chronic arthritis, in the flying pains of rheumatism and in incontinence of urine in children. In all these cases, the external employment of the drug is advantageously combined with its internal administration. In some instances belladonna produces a rash on the skin resembling scarlatina, on which account it has been proposed as a prophylactic of that disease when it rages as an epidemic, and several instances of its apparent success as such were narrated in Germany, but later experience has not confirmed the anticipations which were so confidently put forward at first. Belladonna applied externally in the neighbourhood of the eye, causes, after the lapse of a few hours, dilatation of the pupil unattended with any disturbance of vision; to produce this effect it is employed in the operation for cataract, in iritis to prevent adhesions from forming, and in other ophthalmic affections to enable the posterior chamber of the eye to be examined with greater facility.

The alkaloid atropia has been for some years back used on the continent, particularly in Germany, in the treatment of diseases of the eye; but, so far as we are aware, the only physician in this country who has published his experience of its effects is Mr. Wilde of this city.* He has found a single drop of solution of atropia, No. 1, *(see below)*, dropped on the lower lid, to dilate the pupil to double its ordinary size, or rather more, in from 5 to 15 minutes after its application; the dilatation lasting for four or five days. Mr. Wilde uses the solution of atropia in the same cases as he would extract of belladonna, over which it possesses the advantages:—of being much more efficacious, and much more cleanly, and of producing neither pain nor irritation when dropped into the eye; it is also free from the objection to which extract of belladonna is liable, that of producing an unpleasant eruption around the eye-brow on which it has been applied.

Dose and Mode of Administration.—Dose of the powdered leaves, gr. j., which should be increased very gradually until dryness of the throat is produced.—*Extractum Belladonnæ*, L. E. *Succus spissatus Belladonnæ*, D. ("Fresh belladonna leaves, ℔j.,; bruise them, sprinkled with a little water, in a stone mortar; then press out the juice, and evaporate it unstrained to a proper consistence," D. L.—"Fresh belladonna, any quantity; bruise it in a marble mortar into a uniform pulp, express the juice; moisten the residuum with water and express again. Unite the expressed liquids, filter them, and evaporate the filtered liquid in the vapour bath to the consistence of firm extract, stirring constantly towards the close," E.) Dose, gr. ss., gradually increased to gr. iij. or gr. iv. This is the preparation generally employed to dilate the pupil, for which purpose it is applied round the eye; in spasm of the urethra preventing the introduction of an instrument, the catheter has been smeared with

* *Dublin Quarterly Journal of Medical Science*, November, 1846.

extract of belladonna, but the benefit derived from its use is doubtful. It has been also applied to the os uteri in protracted labour caused by rigidity.—*Emplastrum Belladonnæ,* D. L. E. ("Inspissated juice of belladonna, ʒj.; soap plaster, ʒij.; make a plaster," D.—"Resin plaster, ʒiij.; extract of belladonna, ʒiss.; add the extract to the plaster, melted by the heat of a vapour bath (with a gentle heat, E.), and mix them," L. E.) An excellent local application over the sacrum in dysmennorrhœa, and for the relief of neuralgic and other pains.—*Unguentum Belladonnæ;* (Extract of belladonna, ʒij.; axunge, ʒj.; mix). In painful hemorrhoidal affections, in chordee, in orchitis, and in neuralgia.—*Succus Belladonnæ.* (Prepared by expressing the fresh leaves collected in the beginning of July, setting aside the expressed juice for 48 hours, and adding to the clear decanted liquor a fifth part of rectified spirit). Dose, min. xx. to min. xl. gradually increased.—*Tinctura Belladonnæ,* Blacket. (Extract of belladonna, ʒx.; proof spirit, fʒxvj.; macerate for 14 days, and strain). Dose, min. ij. to min. iij.; fʒi. added to fʒviij. of water has been used as a lotion.—*Solution of Atropia,* Wilde (Atropia, gr. i.; dilute nitric acid, min. i.; rectified spirit, min. iii.; distilled water, fʒi.; mix). A solution of this strength is labelled No. 1.; Nos, 2 and 3 contain respectively two and three grains of atropia.

In poisoning with belladonna, stimulating emetics followed by active cathartics should be employed, with cold applications to the head; and if coma be present, ammonia should be administered, and the usual external stimulants applied.

Cannabis Indica.—*Indian hemp.* According to the most recent observations, it would appear that the Indian hemp is precisely identical in botanical characters with the common hemp of this country, the *Cannabis sativa;* differing only in the secretion of a resin with which it abounds, and which is totally absent in the European kind. It grows in India, Persia and Africa; and belongs to the Natural family *Urticaceæ (Cannabinaceæ,* Lindley), and to the Linnæan class and order *Diœcia Pentandria.*

Botanical Characters.—Annual, about 3 feet high; Stem branching, pubescent, angular; Leaves, alternate or opposite, digitate, scabrous, on long, weak petioles; leaflets, linear, lanceolate, sharply serrated; Flowers, diœcious, in axillary clusters; Achenium, ovate, one-seeded.

Preparation.—The dried plant and resin are both used; the former is cut when the plant is in flower, and allowed to dry in the sun for three days, care being taken not to remove the resin; it is called in India, *Gunjah.* The resin, which is called *Churrus,* is collected in Central India and in Nipal in the following manner:—"Men clad in leathern dresses run through the hemp fields, brushing through the plant with all possible violence; the soft resin adheres to the leather, and is subsequently scraped off, and kneaded into balls; a finer kind is collected with the hand; in some instances the leathern attire is dispensed with, and the resin is gathered on the skins of naked coolies," (O'Shaughnessy).

Physical Properties.—*Gunjah* is sold in bundles about two feet long, and three inches in diameter; it consists of the stems with the leaves and flowers accreted together by the resinous exudation; it is of

a dusky green colour, and has an agreeable narcotic odour (as met with in this country, however, the odour is feeble), and a bitter taste resembling that of tobacco. *Churrus* is a hard resin, of a blackish-grey colour, a fragrant narcotic odour, and a bitterish, acrid, slightly warm taste; it has been as yet imported only in small quantity into this country. The leaves and capsules without the stalks are sold in India under the name *Bang, Subjee,* or *Sidhee;* they have been also imported into Britain, but their medicinal property is very feeble, they should not, therefore, be employed in the preparation of the extract or tincture.

Chemical Properties.—The medicinal virtues of the Indian hemp are due to the resin with which it is covered., and which has been named *cannabin;* this principle appears to be a peculiar resin developed on the plant in warm climates only. The herb contains also a small quantity of volatile oil, which has not been examined. The dried resinous tops of the plant yield to alcohol about 20 per cent. of resinous extract, which is of a dark reddish-brown colour; has a rather fragrant, narcotic odour, resembling that of *Canaster tobacco;* and a bitter, somewhat acrid taste. The *churrus* which has been brought from India, has an odour and taste nearly similar to that of the well prepared extract.

*Adulterations.*—Several specimens of the extract of Indian hemp which I have met with, did not possess the peculiar odour or taste of the extract as prepared under my own direction; whether this arose from faulty preparation, or the substitution of some other substance, I cannot say. The true extract is readily known by its peculiar odour and taste.

Therapeutical Effects.—Although the Indian hemp has been used in Persia, throughout India, and in Africa, for many hundred years, for producing inebriation, and also as a medicinal agent; it has been only recently introduced into British medicine, through the exertions of Dr. O'Shaughnessy, of Calcutta. In its action on the system it is decidedly narcotic, producing at first the effects of a powerful stimulant, which if the dose taken be sufficiently large, are soon followed by those of a direct sedative. The preparations of the Indian hemp have been chiefly employed in the treatment of neuralgic and painful affections; in most of which they have proved very beneficial. Thus, they have been given in tetanus, hydrophobia, infantile convulsions, sciatica, chorea, neuralgic pains, and chronic rheumatism; they have been also used to subdue sleeplessness or disturbed rest, provided it does not arise from inflammation in the head. All who have tried the effects of this remedy in the British Isles, have come to the conclusion, that the Indian hemp must be given in much larger doses in this country than in the East, and on his return home this was acknowledged by Dr. O'Shaughnessy himself. The trials made with it in the diseases above enumerated, would seem to show, that the Cannabis Indica may be often used with benefit, as a substitute for opium, in cases for which that drug is unsuited from idiosyncrasy or any other cause; and also that it does occasionally succeed in abating, sometimes in completely removing, pain, where this agent totally fails us. But the conclusion which an impartial observer must draw from the numerous cases in which Indian hemp was used as a remedy, which have been made public since the first edition of this book was published, is that it is an exceedingly uncertain medicine, producing

the most manifest narcotic symptoms in some individuals, and in others the very same preparation appearing to be perfectly inert: and my own experience of its use fully justifies this conclusion. It cannot therefore be regarded as an addition of much value to the Materia Medica. In consequence of its stimulating properties, the use of Indian hemp is contra-indicated in acute inflammatory diseases.

Dose and Mode of Administration.—The preparations of this drug, which are at present in use, are the resinous extract, and a tincture; they are prepared as follows:—*Extractum Cannabis.* (Take of the dried flowering tops, rejecting the stems, any quantity; rectified spirit a sufficiency; boil the tops in the spirit until all the resin is dissolved out; distil off the spirit with the heat of a vapour bath, so as to obtain an extract of a proper consistence). Dose, gr. j., gradually increased to gr. viij. or gr. x., until a tendency to coma is produced, its effects being carefully watched; gr. ss. to gr. iss. is the dose usually given in the East, and this quantity frequently produces marked symptoms. It is best given in the form of pill.—*Tinctura Cannabis,* (Extract of Indian hemp, gr. ij.; rectified spirit, f℥i.; dissolve). Dose, f℥ss. to f℥ij. frequently repeated until the desired effect is produced. This tincture is decomposed by water, the resin being precipitated in the form of a pale yellow powder. It should be, therefore, suspended in aqueous vehicles, by means of mucilage, syrup, or yolk of egg.

Hyoscyamus, E. Hyoscyamus niger, folia (et semina, L.), D. L. *Henbane; the leaves (and seeds,* L.) *of Hyoscyamus niger.* An indigenous plant, belonging to the Natural family *Solanaceæ,* and to the Linnæan class and order *Pentandria Monogynia.*

Botanical Characters.—Annual or biennial; Stem, much branched, rounded; Leaves, subovate, amplexicaul, sinuated; Flowers, nearly sessile, dingy yellow with purplish veins; Capsules, 2-celled, many-seeded, when the seeds are ripe the upper part falling off like a lid; the whole plant is covered with unctuous fetid hairs.

Preparation.—The leaves of the biennial plant should be preferred; they are to be gathered when the plant is in full flower, and dried quickly at a temperature not above 120°. The seeds are contained only in the London Pharmacopœia; they should be collected when fully ripe.

Physical Properties.—Hyoscyamus leaves, when carefully dried, are of a greenish-yellow colour, have a clammy feel, a fetid, narcotic odour, and a bitter nauseous taste; in the fresh state, the odour and taste are similar but more powerful, and the colour is dull green. The seeds are ovoid, compressed, rough, of a brownish-yellow colour; they have a feeble narcotic odour, and a bitter, somewhat acrid taste.

Chemical Properties.—Hyoscyamus leaves contain a narcotic extractive soluble in water and alcohol, bitter extractive, gummy extractive, and salts of magnesia, (Lindbergson). M. Brandes announced the discovery of a vegetable alkaloid, which he named *hyoscyamia,* in the leaves and seeds of the Hyoscyamus niger, but his statements have not been confirmed by more recent experiments. Runge has, however,

shewn that this was owing to the employment of a caustic alkali to separate it; and by using magnesia for this purpose he has obtained vegetable alkalies from belladonna, henbane and stramonium, the three of which resemble each other so closely, that there is reason for believing that they are identical. According to the analysis of Kirshoff, the seeds consist of 28·3 per cent of volatile and narcotic matter, 15·6 per cent of fixed oil with some resin, 2·3 per cent of extractive, with sugar, gum, lignin, albumen, and some salts. The leaves and seeds of the henbane impart their virtues to water, alcohol, ether, and the fixed and volatile oils.

*Adulterations.*—The admixture of any other leaves with those of the Hyoscyamus niger may be readily detected by their physical properties. The leaves lose much of their activity by keeping, they should be therefore gathered every year. When henbane is badly preserved, the odour and taste is very feeble.

Therapeutical Effects.—Taken in large quantity, every part of this plant acts as a powerful narcotico-acrid poison, producing delirium, followed by sopor with marked dilatation of the pupil, which, if active treatment be not immediately employed, is the precursor of death. In medicinal doses, its operation is narcotic; but it is distinguished from most other medicines of this class by several peculiarities. Thus, the preliminary or stimulant stage of its operation, even when taken in small doses frequently repeated, is very slight, often not at all discernible; and in the second stage of its operation, it causes sleep, rather by lessening excitability and allaying pain, than by any direct action on the nervous system; under its continued use, also, the bowels are gently acted on, and do not become constipated, as occurs when opium is taken. In consequence of these properties, hyoscyamus is employed with much advantage in many painful diseases in which from any circumstance the use of opium is objectionable. It is especially found beneficial, in sleeplessness, or irritability, when the symptoms of pyrexia, as hot skin, thirst, delirium, &c., are present; in all forms of neuralgic and spasmodic affections where there is great excitability of the nervous system, and in which the stimulating effects of opium would prove injurious; in irritation of the bronchial mucous membrane causing cough; and in diseases of the urinary organs. There are, however, many persons in whom hyoscyamus produces great excitement, headache, and even delirium; and in such its use should be carefully avoided. Given in combination with active cathartics, it corrects their griping qualities without diminishing their activity. Externally, fomentations or cataplasms of hyoscyamus are employed to diminish pain in glandular enlargements, painful ulcerations, hemorrhoidal affections, &c. The best preparation for this purpose is the oil of hyoscyamus of the Parisian Codex, the formula for preparing which, will be found in the next paragraph.

Dose and Mode of Administration.—In powder the leaves may be given in doses of gr. v. to gr. x.; or the seeds in doses of gr. iij. to gr. viij.; the following preparations, however are generally employed:—*Extractum Hyoscyami,* L. E. *Succus spissatus Hyoscyami,* D. ("Prepared in the same manner as the similar preparation of bella-

donna," D. L.—"To be prepared by any of the processes directed for extract of conium," E.). The continued evaporation by heat to which this extract is subjected, when prepared according to the formula of the Dublin and London Colleges, impairs its activity; prepared according to the Edinbugh Pharmacopœia it is much more powerful. Dose, gr. v. to gr. xv., given in the form of pill.—*Tinctura Hyoscyami*, D. L. E. (Hyoscyamus leaves, dried (and in moderately fine powder, E.), ℥v.; proof spirit, Ibij. (Oij. L. E.); digest (macerate, L.) for 7 (14, L.) days, and strain. "It is best prepared by the process of percolation, as directed for the tincture of capsicum," E.). Dose, f℥ss. to f℥ij.—*Succus Hyoscyami*, (Fresh hyoscyamus leaves, any quantity; express the juice with a powerful press, set aside for 48 hours, pour off the clear supernatant liquor, and add to it a fifth part of rectified spirit). This is the best preparation of henbane. Dose, min. xx. to min. xl.—*Oleum Hyoscyami*, P. (Fresh hyoscyamus leaves, 500 parts; olive oil, 1000 parts; bruise the hyoscyamus, mix with it the oil, and heat over a very gentle fire until all the water is evaporated; then digest for two hours, and strain with expression). Used only as an external application.

Incompatibles.—The vegetable acids; nitrate of silver; and acetate of lead.

In poisoning with hyoscyamus, stimulating emetics, and the stomach pump should be immediately employed, to be followed by external and internal stimulants, and afterwards blood-letting. Several cases of poisoning with henbane have been published in the Italian Journals, in which lemon-juice in large quantity proved a complete antidote.

Lactucarium, L. E. Lactuca sativa, herba, D. Lactuca virosa, folia, D. *Lactucarium. Lettuce-opium. The inspissated juice of Lactuca sativa*, L.—*of Lactua sativa and Lactuca virosa*, E. *The herb of Lactuca sativa, and the leaves of Lactuca virosa*, D. Both these species of Lactuca belong to the Natural family *Compositæ (Asteraceæ*, Lindley,) and to the Linnæan class and order *Syngenesia Æqualis*. The former, though extensively cultivated in the British Isles, was originally introduced probably from the East; the latter is indigenous. Lactucarium may be also obtained from the *Lactuca scariola* and *Lactuca sylvestris*, and according to Aubergier the best is procured from the *Lactuca altissima*.

Botanical Characters.—*Lactuca sativa* is an annual; Stem, erect, smooth, cylindrical, branching above, 1-2 feet high; Leaves, rounded, or ovate, more or less wrinkled, generally sheathing at the base, of a pale green colour; Flowers, pale yellow, small, in terminal corymbs.—*Lactuca virosa* is a biennial; Stem, erect, prickly, 3-4 feet high; Leaves, distant, patent, oblong, toothed, two-eared and amplexicaul at the base, their keel prickly; Flowers, small, yellow, in panicles.

Preparation.—As soon as the flowering stem of either of these plants shoots up, it abounds in a white milky juice, which did not before exist; this juice, when dried spontaneously, constitutes *lactucarium* or *lettuce-opium*. It is obtained by slicing off the flowering head, before the flowers expand, collecting the milky juice which exudes, and removing a fresh slice of the stem as long as

it yields any white juice. The recent investigations of Mr. Duncan of Edinburgh, have shown that the Lactuca virosa yields three times as much lactucarium as the garden lettuce, and that its quality also is superior. The milky juice exists in the leaves as well as in the flowering stem of the wild lettuce, in consequence of which they are the officinal part of the plant in the Dublin Pharmacopœia.

Physical Properties.—It is met with in large, roundish, rough masses, of an umber brown colour; it has a narcotic odour, which closely resembles that of opium, and a disagreeable, bitter taste.

Chemical Properties.—Lactucarium consists of a peculiar neutral bitter crystalline principle *(Lactucin,)* mannite, asparagine, a crystallizable matter which colours the persalts of iron green, an electro-negative resin combined with potash, a simple resin, wax, myricine, ulmic acid, pectin, albumen, numerous salts, (Aubergier). Of these the *Lactucin* is the active principle, it appears to be to lactucarium what morphia is to opium; it is slightly soluble in cold but more so in boiling water, it is also soluble in alcohol, but is insoluble in ether. By heat lactucarium softens, and is partially fused; it is inflammable, and burns with a white flame. It yields its virtues partially to cold or boiling water, but more completely to alcohol.

Therapeutical Effects.—Lactucarium, in its operation on the system, resembles opium in many respects, but it produces scarcely any excitement, consequently it may be employed as a substitute for that drug in cases in which a stimulant effect is objectionable. It is, however, uncertain in its operation, and in many persons even when given in very large doses does not produce any effect. It has been principally employed as an anodyne in phthisis, but when its use has been continued for even a comparatively short period, I have found it to lose its powers of producing rest, although the quantity given was much increased. Lactucarium has been also employed as a narcotic in febrile and inflammatory affections, in rheumatism, in arthritis, and in nervous disorders, where opium is contra-indicated from any cause.

Dose and Mode of Administration.—Gr. v. to gr. xx. in the form of pill.—*Tinctura Lactucarii,* E. (Lactucarium in fine powder, ℥ij.; proof spirit, Oj.; this tincture is best made by percolation as directed for tincture of myrrh; but may also be prepared by digestion with coarse powder of lactucarium). Dose, f℥i. to f℥ij. Every fluid-drachm of this tincture contains gr. vj. of lactucarium.—*Trochisci Lactucarii,* E. (To be prepared with lactucarium, in the same proportion, and in the same way as opium lozenges). Dose, ℈i. to ℈ij. daily. Each lozenge of ten grains contains nearly one-seventh of a grain of lactucarium.—*Extractum Lactucæ,* L. (Fresh lettuce leaves, ℔j.; bruise them, sprinkled with a little water, in a stone mortar; then press out the juice, and evaporate it unstrained, to a proper consistence). A bad preparation, sometimes substituted for lactucarium; from which it may be known by its greater compactness, and very feeble odour. Dose, ℈i. to ʒi.

Lupulus, L. E. Humulus lupulus, strobili siccati, D. *Hops. The dried Strobiles (Catkins, E.) of Humulus lupulus.* Scarcely indigenous, probably introduced from Holland; it belongs to the Natural family *Urticaceæ (Cannabinaceæ,* Lindley*)*, and to the Linnæan class and order *Diœcia Pentandria.*

Botanical Characters.—Stems, long, weak, and climbing, scabrous; Leaves, petiolate, 3-5 lobed, serrated, veiny, rough; Flowers, greenish-yellow.
Preparation.—The aggregated fruits, *catkins or strobiles,* when dried, constitute the hops of commerce; they are gathered and picked in September, and dried in kilns.

Physical Properties.—Hops occur in the form of thin, papery, greenish-yellow scales, variously veined, and sprinkled with a golden-yellow powder; they have a peculiar aromatic odour, and an aromatic, very bitter taste.

Chemical Properties.—The principal virtue of hops is due to the yellow powder which has been called *lupulin,* it constitutes about a sixth part of good hops, and may be readily obtained in a separate state by rubbing and sifting. The scales are composed of astringent matter, inert colouring matter, chlorophylle, gum, lignin, and salts of potash and lime, with some adhering *lupulin,* (Payen and Chevallier). Lupulin is in the form of a coarse yellow powder, of a cellular texture; it consists of 2 per cent. of volatile oil, 10·3 of bitter principle *(lupulite)*, 50 to 55 of resin, 32 of lignin, &c. Hops and lupulin yield their active properties to both water and alcohol.

Therapeutical Effects.—Much difference of opinion exists as to the therapeutical properties of hops; they are generally stated to be narcotic, but from the experiments made with them by Magendie and others on animals, it would appear that this effect is not manifested, when they are given internally, no matter how large the dose. Nevertheless, the inhalation of the aroma of hops acts decidedly narcotic, frequently producing sleep in the restlessness and watchfulness of mania and other nervous affections, when opium and other narcotics have completely failed. To produce this effect, a pillow stuffed with hops is generally employed. The solution of the bitter principle of the hop in malt liquors serves to make them keep better, and also confers on them aromatic and tonic properties.

Dose and Mode of Administration.—*Lupulin,* gr. vj. to gr. xij. in powder or pill; if the hop possesses any narcotic property, it must be concentrated in this substance, as in it alone is centred all the aroma.—*Extractum Humuli,* D. *Extractum Lupuli,* L. E. ("Prepared as the simpler extracts," D. "As the extract of Logwood," E.—"Hops, lbss.; boiling distilled water, cong. ij.; macerate for 24 hours: then boil down to a gallon, and strain the liquor while yet hot; lastly, evaporate to a proper consistence," L.). Dose, gr. v. to gr. xx.—*Infusum Lupuli,* L. (Hops, ʒvj.; boiling distilled water, Oj.; macerate for 4 hours in a vessel lightly covered and strain). A mild bitter, very feebly, if at all narcotic. Dose, fʒj. to fʒij.—*Tinctura Humuli,* D, *Tinctura Lupuli,* L. E. ("Hops, ʒv. (ʒvj. L.); proof spirit, lbij. (Oij. L.); macerate for 14 days (frequently shaking D.), and strain." D. L.—"Take any

convenient quantity of hops recently dried, separate by friction and sifting the yellowish-brown powder attached to their scales; then take, of this powder, ʒi.; and of rectified spirit, fʒviij.; and prepare the tincture by percolation or digestion as directed for tincture of Capsicum," E.) Dose, fʒss. to fʒij.

Incompatibles.—Mineral acids; and the salts of iron, lead, mercury, and silver.

Morphia, L.—*Morphia. A peculiar principle on which the medicinal activity of opium chiefly depends.*

Preparation.—*Lond.*—"Hydrochlorate of morphia, ʒi.; solution of ammonia, fʒv.; distilled water, Oj.; add the hydrochlorate of morphia, first dissolved in the pint of water, to the solution of ammonia with an ounce of water, shaking them together; wash what is thrown down with distilled water, and dry with a gentle heat."

Physical Properties.—Thus obtained, morphia is in the form of a white crystalline powder, the crystals being very minute; but by solution in boiling alcohol and slow evaporation, they may be obtained much larger; their primary form is the right rhombic prism. They are inodorous, but have a sensibly bitter taste.

Chemical Properties.—It consists of $C^{35}$ $H^{20}$ $O^{6}$ N. It is permanent in the air, it is fused by heat, and by a high temperature it is decomposed. It is inflammable, burning with a bright flame and a peculiar odour, and leaving a carbonaceous residuum. It requires 1000 parts of water to dissolve it, the solution possessing an alkaline action; it is scarcely soluble in ether, but dissolves in 40 times its weight of cold and in 30 times its weight of boiling alcohol; it is very soluble in solution of caustic potash, soda, or lime water, and but feebly so in ammonia. The best characteristic of morphia and its salts, is the property which they possess of striking a deep blue colour with the solution of a per-salt of iron made as nearly neutral as possible.

Therapeutical Effects.—Morphia, on account of its insolubility is not used in medicine; its therapeutical effects, therefore, will be more conveniently considered when treating of the muriate of morphia, the most frequently employed of its salts. The dose of the pure alkaloid would be from one-fourth to one-half of a grain in the form of pill.

Morphiæ acetas, L. E. *Acetate of Morphia.*

Preparation.—*Lond.*—"Morphia, ʒvj.; acetic acid fʒiij.; distilled water, fʒiv.; mix the acid with the water, and pour them upon the morphia to saturation. Let the liquor evaporate with a gentle heat that crystals may be formed." *Edin.*—"Muriate of morphia, any convenient quantity. Dissolve it in 14 times its weight of warm water; and when the solution is cool, add Aqua ammoniæ gradually, and with constant agitation, until there is a permanent but faint odour of ammonia in the fluid. Collect the precipitate on a calico filter, wash it moderately with cold water, and dissolve it by means of a slight excess of pyroligneous acid in 12 parts of warm water for every part of muriate of mor-

phia that was used. Concentrate the solution over the vapour bath and set it aside to crystallize. Drain and squeeze the crystals, and dry them with a gentle heat. More acetate of morphia may be obtained on concentrating the mother-liquor."

Physical Properties.—As usually met with, acetate of morphia is a greyish-white powder, sometimes obscurely crystalline; when pure, however, it is snow white and in distinct crystals. It is inodorous, but when moistened emits a feeble odour of acetic acid; its taste is intensely bitter.

Chemical Properties.—It is composed of one eq. of acetic acid and one of morphia. Exposed to the air it loses a portion of its acid, and is then partially insoluble in water; it is decomposed by heat, and dissipated without any residuum. Acetate of morphia is very soluble in water and in alcohol. When the base is not completely saturated with acid, its solution in water may be readily accomplished by adding a few drops of acetic acid.

*Adulterations.*—When the salt is properly prepared, it is of a snow-white colour, and readily soluble in water. The following test of the *Edinburgh Pharmacopœia* which indicates the exact quantity of morphia that ought to be present, guards against the adulteration with any other white powder:—"One hundred measures of a solution of gr. x. in f℥ss. of water, and min. v. of acetic acid, heated near to 212°, and decomposed by a faint excess of ammonia, yield by agitation a precipitate which in 24 hours occupies 15·5 measures of the liquid."

Therapeutical Effects.—The uses and dose of this preparation are precisely similar to those of the muriate to be next described; the latter salt should be always preferred, as it is more easily prepared, keeps better, and is generally more pure.

Incompatibles.—The stronger acids; the alkalies, and alkaline earths; most earthy and metallic salts; and astringent vegetable infusions and decoctions.

## Morphiæ murias, E. Morphiæ hydrochloras, L. *Muriate of Morphia; Hydrochlorate of Morphia.*

Preparation.—*Lond.*—Take of opium, sliced, ℔j; crystals of chloride of lead, ℥ij., or a sufficiency; purified animal charcoal, ℥iiiss.; hydrochloric acid; distilled water; solution of ammonia, each, as much as may be sufficient; macerate the opium in Oiv. of distilled water for 30 hours, and bruise it; afterwards digest it for 20 hours more and press it. Macerate what remains again and a third time in water, that it may become free from taste, and as often bruise and press it. Evaporate the mixed liquors, with a heat of 140°, to the consistence of a syrup. Then add Oiij of distilled water, and when the impurities have subsided pour off the supernatant liquor. Gradually add to this ℥ij. of chloride of lead, or as much as may be sufficient, first dissolved in Oiv. of boiling distilled water, till nothing further is precipitated. Pour off the liquor and wash what remains frequently with distilled water. Then evaporate the mixed liquors as before, with a gentle heat, that crystals may be formed. Press these in a cloth, then dissolve them in a pint of distilled water, and digest with ℥iss. of animal charcoal, in a heat of 120°, and strain. Lastly, the charcoal being thoroughly washed, evaporate the liquors cautiously that pure crystals may be

produced. To the liquor poured off from the crystals first separated, previously mixed with a pint of water, gradually drop in as much solution of ammonia, frequently shaking it, as may be sufficient to precipitate all the morphia. To this washed with distilled water, add hydrochloric acid that it may be saturated; afterwards digest it with ʒij. of animal charcoal, and strain. Lastly, the animal charcoal being thoroughly washed, evaporate the liquors cautiously, that pure crystals may be produced."—*Edin.*—"Take of opium, ʒxx.; water, Oviij.; muriate of lime, ʒi., or a slight excess; macerate the opium in fragments for 24 hours in Oij. of the water; and separate the infusion, squeezing well the residue. Repeat the maceration successively with Oij. more of the water, till the whole is made use of. Concentrate the whole infusions over the vapour-bath. Decant the clear liquid, and add the muriate of lime dissolved in fʒiv. of water. Set the whole aside to settle; pour off the liquid; wash the sediment with a little water, adding the washings to the liquid. Evaporate the liquid sufficiently in the vapour-bath for it to solidify on cooling. Subject the cooled mass to very strong pressure in a cloth; redissolve the cake in a sufficiency of warm distilled water; add a little fine powder of marble, and filter; acidulate the filtered fluid with a very little muriatic acid; and concentrate a second time in the vapour-bath for crystallization. Subject the crystals again to very strong pressure in a cloth. Repeat the process of solution, clarification by marble and muriatic acid, concentration and crystallization, until a snow-white mass be obtained.—On the small scale trouble and loss are saved by decolorizing the solution of muriate of morphia by means of a little purified animal charcoal after two crystallizations. But on the large scale it is better to purify the salt by repeated crystallizations alone, and to treat all the expressed fluids, except the first, in the same way with the original solution of impure muriate of morphia. An additional quantity of salt may often be got from the first dark and resinous fluid obtained by expression, on merely allowing it to remain at rest for a few months, when a little muriate of morphia may be deposited in an impure condition.—The opium which yields the largest precipitate by carbonate of soda, according to the formula for testing opium, will yield muriate of morphia, not only in the greatest proportion, but likewise with the fewest crystallizations."

Physical Properties.—Muriate of morphia is usually met with in the form of a fine soft, snow-white powder, but it may be readily obtained in feathery, acicular crystals. It is without odour, but has an intensely bitter, peculiar taste.

Chemical Properties.—It is composed of one eq. of muriatic acid, one of morphia, and (in the crystalline state) six of water of crystallization. It is permanent in the air, is fusible by heat, and by a red heat is decomposed and totally dissipated. Muriate of morphia requires for its solution from 14 to 20 parts of cold water, but is soluble in less than its own weight of boiling water; it is also readily dissolved by alcohol.

*Adulterations.*—The only impurities which are at present commonly met with in this salt, are colouring matter and moisture, both of which arise from faulty preparation. The tests of the *Edin. Phar.* guard against these contaminations, as well as against the adulteration with any similar white powder.—"Snow-white; entirely soluble; solution colourless; loss of weight at 212° not above 13 per cent; one hundred measures of a solution of gr. x. in fʒss. of water, heated near to 212°, and decomposed with agitation by a faint excess of ammonia, yield a precipitate which in 24 hours occupies 12·5 measures of the liquid."

Therapeutical Effects.—Notwithstanding the observations of

many, that morphia is free from the stimulating effects of opium, and that it acts purely as an anodyne sedative; it would appear that it possesses essentially, though perhaps not quite identically, the actions of the drug itself. Thus, given in small doses its first effect is to cause a feeling of excitement of the circulation, and in some persons of the nervous system also; the stage of excitement, however, is never so distinctly marked as when opium has been taken, and sedative effects are more immediately consequent on it. Morphia and its salts will, in some persons, but not so frequently as opium, produce the disagreeable subsequent feelings of nausea and head-ache caused by that drug; but constipation, sweating, or dryness of the tongue, very rarely follow their employment. There are two effects produced by morphia and its salts, when taken in medicinal doses, which do not seem to be caused by opium, namely, a peculiar sensation of itchiness over the whole surface of the body, in some cases even attended by a cutaneous eruption; and irritability of the bladder, accompanied with a difficulty in voiding the urine; the latter symptom is most distinctly marked when any of the salts of morphia have been taken in full doses. The salts of morphia may be employed in most instances to fulfil the same intentions as opium and its preparations, and which will be fully considered in the next article. We prefer their use to that of opium, where from any cause we wish to employ that drug without the knowledge of our patient; or where our intentions will be best answered by applying the remedy to the denuded dermis, as in certain local affections especially those of a nervous character. The insertion of a few drops of a concentrated solution of muriate of morphia in creasote or in water, into the areolar tissue over the seat of the pain, has been latterly practised with much success in the treatment of sciatica, tic douloureux and various neuralgic pains; an instrument for the purpose has been invented by Mr. Rynd of this city, and is manufactured by Messrs. Weiss of London, but it may be done nearly as effectually by means of a common lancet. Like opium, the salts of morphia lose their effect by repetition, and consequently the dose must be gradually increased.

Dose and Mode of Administration.—The dose of the muriate or acetate of morphia is from gr. $\frac{1}{4}$. to gr. ss.; after they have been employed for any length of time, so large a dose as gr. viij. to gr. x. will be required to act as a narcotic. When applied endermically, the cuticle is to be removed by means of a blister, and gr. j. to gr. ij., sprinkled over the denuded dermis. The salts of morphia may be also introduced into the system by inoculation with a lancet dipped in their aqueous solution; the punctures may be made on the anterior part of the forearm, and the fourth of a grain thus introduced will be generally found to produce sleep.—*Morphiæ Muriatis solutio*, E. (Muriate of morphia, ℥iss.; rectified spirit, f℥v.; distilled water, f℥xv.; mix the spirit and the water, and dissolve the muriate of morphia in the mixture with the aid of a gentle heat). The strength of this preparation is intended to be equivalent to tincture of opium; f℥j. contains gr. ivss. of muriate of morphia. Dose, min. xx. to min xl.—*Trochisci Morphiæ*, E. (Muriate of morphia, ℈j.; tincture of tolu, ℥ss.; pure sugar, ℥xxv.; dissolve the muriate of morphia in a little hot water, mix it and the tincture of tolu

with the sugar, and with a sufficiency of mucilage form a proper mass for making lozenges, each of which should weigh about fifteen grains). Each lozenge contains a little more than a fortieth of a grain of muriate of morphia. Principally used to allay tickling cough in chronic pectoral affections. Dose, N° x. to xij. daily.—*Trochisci Morphiæ et Ipecacuanhæ*, E. (Muriate of morphia, ϑj.; ipecacuan, in fine powder, ℥i.; tincture of tolu, f℥ss.; pure sugar, ℥xxv.: proceed as for *morphia lozenges)*. Dose and uses the same. In addition to the morphia, each lozenge contains about a fourteenth of a grain of ipecacuanha.

Incompatibles.—Alkalies, and alkaline earths; most earthy and metallic salts; and astringent vegetable infusions and decoctions.

Morphiæ sulphas. *Sulphate of Morphia.* This salt of morphia is not often used in medicine in this country, but it bears a high character in America, and is officinal in the pharmacopœia of the United States. It may be readily prepared by mixing morphia in powder with distilled water and carefully adding diluted sulphuric acid till the morphia is saturated and dissolved. It occurs in snow-white feathery crystals which are completely soluble in water. It is composed of 1 eq. of morphia, 1 of sulphuric acid, and 6 of water of crystallization. The dose is the same as that of the muriate, over which it does not appear to possess any advantage.

Opium, D. L. E.—*Opium. Concrete juice from the unripe capsules of Papaver somniferum.* Probably originally a native of Asia, Egypt, and the South of Europe, but now growing wild and extensively cultivated in most parts of the world; it belongs to the Natural family *Papaveraceæ*, and to the Linnæan class and order *Polyandria Monogynia.*

Botanical Characters.—Annual; Stem, erect, cylindrical, branched, glaucous green, 2-6 feet high; Leaves, amplexicaul, alternate, undulated, incised, ovato-oblong, glaucous beneath; Flowers, large, terminal, pendulous before expansion, with two deciduous sepals, and four petals, generally white with a purple eye, some varieties red or dark-purple; Capsules, obovate or globose, smooth, many-seeded; Seeds, small, roundish or reniform, oily.

Preparation.—Opium is obtained from the capsules of the poppy by a nearly similar process in all parts of the world in which it is prepared:—A few days after the petals fall off, incisions are made horizontally and obliquely with some sharp instrument, through the epicarp and sarcocarp of the capsule, taking care not to penetrate the cavity. A white milky juice exudes in drops, which is allowed to remain on the poppy head for 24 hours. It is then scraped off, and deposited in earthen or wooden vessels, in which it is assiduously stirred until the different collections made are thoroughly inspissated, water being sometimes added to keep up the moisture. The opium is finally dried without heat, first in small cakes, afterwards in large masses, and in most places wrapped in poppy leaves to prevent them from adhering.

Physical Properties.—The opium met with most commonly, at present almost entirely, in British commerce, is called Turkey Opium,

and is principally brought from Smyrna, a small quantity occasionally coming direct from Constantinople. Smyrna Opium occurs in irregularly rounded lumps, varying in weight from a few ounces to two or even three pounds, the most general size being from a pound and a half to two pounds. When first imported it is usually so soft as to be readily imprinted with the fingers, but it quickly becomes hard by keeping. Each lump is covered externally with the reddish winged seeds of some species of *Rumex*, and sometimes also with poppy leaves; it is of a brownish colour, and has a waxy lustre when cut; its odour is strong and narcotic, and its taste bitter, acrid, and nauseous. Constantinople Opium occurs in small flattened cakes covered with a poppy leaf, but without any *Rumex* seeds. It is hard, and of a hair-brown colour; its odour and taste are more feeble than the preceding sort. Egyptian Opium is also sometimes met with in the British market, but within these last few years, it has been very scarce. It occurs in flattened round cakes, from 3 to 8 ounces in weight, each cake being wrapped up in a poppy leaf, with the midrib of which it is indented; it varies much in consistency, some pieces being very soft and others tolerably hard; but most of it attracts moisture from the air so as to become soft by keeping. It has a reddish brown colour; its odour and taste are comparatively feeble. East Indian Opium is not an article of British commerce, being prepared chiefly for the Chinese market. For specimens of the different sorts usually prepared, I am indebted to the kindness of Professor Christison of Edinburgh, and to my friend Mr. Johnson, late assistant opium inspector at the great factory of Behar. Three kinds are commonly met with; Bengal Opium, which includes that prepared at the factories of Behar and Benares, Garden Patna and Malwah opium. *Bengal Opium* is met with in large round balls from three to four pounds weight, surrounded with a thick envelope of leaves firmly agglutinated together. The contained opium is quite soft and of a blackish colour; its odour and taste are purely opiate, it is now scarcely ever prepared, being superseded by the two following sorts, and specimens of it are consequently very rare. *Garden Patna Opium* occurs in flat square cakes from three to four inches square, and about half an inch thick; while still soft, it is closely enveloped in thin plates of mica, which firmly adhere to it. It has a reddish-brown colour, homogeneous throughout, and a rather agreeable strongly opiate odour. *Malwah Opium* is in flattened round cakes, five or six inches in diameter; it is hard and brittle, covered externally with a coarse greyish dust, internally it is of a light brown colour, and has a shining fracture; its odour is much more feeble than that of Garden Patna opium. Opium was also formerly prepared in England of very fine quality, but owing to the losses which were sustained from the uncertainty of our climate, the cultivation of the poppy with that intention is now quite abandoned. It is at present prepared in some parts of France, and of Germany, for the purpose of procuring morphia from it. A variety of opium under the name of *Persian opium*, is described as having been imported some years since from Trebizon on the Black Sea; it was in cylindrical sticks about six inches long, and half an inch in diameter, wrapped separately in paper; it was of a pale brown colour, had an opiate, somewhat musty

odour, and an intensely bitter taste; it appeared to be a very inferior article. Opium has been also recently imported into France from the neighbourhood of Algiers; it is described as resembling closely the best specimens of Smyrna opium; and the cultivation of the poppy there for the purpose of supplying France with opium, is at present in contemplation. Of the different varieties of opium above described, the finer qualities of Turkey opium should be preferred for medical purposes.

Chemical Properties.—According to the most recent, as well as the most complete analyses, that have been made of opium, the substances of which it is composed appear to be the following:—*Morphia, codeia, narcotina, thebaina or paramorphia, narcein, meconin, meconic acid, sulphuric acid, gum, albumen, resin, fixed oil, a trace of volatile oil (its odorous principle), lignin, caoutchouc, extractive matter, and numerous salts of inorganic bases.* The first seven are peculiar principles found only in opium; they may be conveniently classed as follows, with repect both to their chemical and physiological properties:—

| *Substances.* | *Medicinal Property.* |
|---|---|
| 1.—Alkaloids. | |
| Morphia ($C^{35}$ $H^{20}$ $O^{6}$ N) | Narcotic. |
| Codeia ($C^{35}$ $H^{20}$ $O^{5}$ N) | Narcotic. |
| Narcotina ($C^{48}$ $H^{24}$ $O^{15}$ N) | Bitter; resembling Quina. |
| Thebaina ($C^{25}$ $H^{14}$ $O^{3}$ N) | Stimulant; resembling Strychnia. |
| 2.—Neutrals. | |
| Narcein ($C^{28}$ $H^{20}$ $O^{12}$N) | Inert. |
| Meconin ($C^{10}$ $H^{5}$ $O^{4}$) | Inert. |
| 3.—Acid. | |
| Meconic Acid ($C^{14}$ H $O^{11}$) | Inert. |

The constituents of opium are partially soluble in water, either warm or cold, about a third being left undissolved, which consists chiefly of a dark viscid substance resembling caoutchouc, and narcotin; it is more soluble in alcohol and ether, but a small portion is still left undissolved. The watery infusion is of a dark brown colour, and has an acid reaction. It is precipitated by the alkalies, and alkaline earths when not added in excess; by the soluble salts of iron and of lead, by the salts of lime and magnesia, by tincture of galls, and by all astringent vegetable matters. Of the different substances above enumerated as existing in opium, the only one of importance in relation to medicine is *morphia*, which has been before described; it exists in opium combined with meconic and sulphuric acids. *Codeia* has been used in France by Magendie and others as a narcotic; it is about half the strength of

morphia. *Narcotina* was originally generally believed to be the stimulating principle of opium; but more recent investigations, especially those of Dr. O'Shaughnessy of Calcutta, have shewn that it is completely devoid of any stimulant or narcotic properties, and that like quina, it is capable of arresting the paroxysms of remittent and intermittent fevers; more than 160 cases of ague successfully treated with narcotina by himself and others, have been recently published by that physician. *Thebaina*, from Magendie's experiments, appears to be a powerful poison, one grain injected into the jugular vein or placed in the pleura, acts like strychnia, causing tetanus and death in a few minutes. *Meconic acid* produces a deep cherry-red colour with the persalts of iron; and this forms the most important characteristic of opium in medico-legal researches.

*Adulterations.*—Opium is very extensively adulterated, and also varies exceedingly in quality, in consequence of the mode in which it is prepared. Many of the impurities which exist in opium may be detected by a careful physical examination; such as moisture, sand, stones, leaves, woody fibre, pieces of metal, seeds, &c. But by external characters, it is very difficult to judge accurately of the quality of opium, and the only sure criterion is to ascertain the quantity of morphia contained in a given specimen of the drug. This can only be done accurately by proceeding according to either of the processes given for the preparation of muriate of morphia. "A pound of good opium thus treated, should yield at least ten per cent of snow-white salt," (Christison). The following test for the goodness of opium given in the Edinburgh Pharmacopœia, is intended to indicate the quantity of morphia, narcotina, and resinous extractive contained; but it is difficult of application, and at best can be only a doubtful criterion of quality: "A solution from 100 grains of fine opium macerated 24 hours in f℥ij. of water, filtered and strongly squeezed in a cloth, if treated with a cold solution of ℥ss. of carbonate of soda in two waters, yields a precipitate which weighs when dry at least ten grains, and dissolves entirely in solution of oxalic acid." The following process proposed by M. Payen is one easy of execution and sufficiently accurate for most pharmaceutical purposes :—℥viss. of opium are cut into very thin slices and left to macerate for 24 hours in f℥v. of pure water; then triturated in a mortar till the hydrated matter becomes clear, when the most finely divided parts which the liquid holds in suspension are decanted on a filter. Water is added to the residue which is again triturated, and the whole poured on the same filter and washed in the distilled water until the liquor passes through colourless. Recently slaked lime is added in excess to the filtered solution, and the mixture boiled for five minutes and filtered. To the filtered solution sufficient pure muriatic acid is added to saturate the lime and combine with the morphia. The morphia is precipitated by ammonia, collected on a filter and washed; it is then dissolved in rectified spirit and crystallized, and the crystals washed in the ether to remove the narcotina. The residue, which is tolerably pure morphia, is washed and dried and then weighed. Good opium thus treated yields from 4 to 5 per cent.

Therapeutical Effects.—In excessive doses, opium is a powerful

narcotic poison, producing giddiness and stupor with scarcely any previous excitement, soon after it is taken; the stupor increases rapidly, accompanied with complete torpor, slowness of breathing, depressed circulation, general relaxation of the muscles, contracted pupils, and unless active treatment be speedily employed, death quickly ensues. In medicinal doses, opium generally produces at first excitement of the vascular system, which is accompanied with exhilaration of the nervous functions; these effects are marked by an increase in the force and frequency of the pulse, with increased heat of the body, and by the pleasurable sensations which are experienced throughout the whole system. Soon after, unless the dose be repeated, the sedative influence of the drug becomes obvious; the general excitement is calmed, pain is diminished, a disinclination to muscular exertion produced, and the force of external impressions on the senses diminished; this state is succeeded by sleep more or less profound, which lasts usually from six to eight hours. On awaking from the sleep produced by opium, nausea, head-ache, loss of appetite, and indisposition to any active exertion are very generally experienced. The effects of opium are modified by a variety of circumstances, but most remarkably of all, by habit. This is well exemplified by a reference to the customs of some Eastern countries, as Turkey, Persia and China, where the drug is commonly employed to produce a species of intoxication or excitement. In the two former countries the opium is eaten, in the latter it is smoked, but in either way the quantity used must be increased daily or it ceases to produce the desired effect. Instances of opium-eating occur also constantly in the British Islands; and a graphic account of the effects produced by its pernicious habit as experienced by himself, is given by Mr. De Quincy in his *Confessions of an English Opium-eater*. Amongst the Turks, the *Theriaci* (opium-eaters) generally begin with doses of from one to two or three grains, and increase the quantity gradually till it amounts to two, three, or in many instances to six drachms. In this country, also, it is taken in immense quantities by opium-eaters, f℥iij. of laudanum being a common daily allowance, and in some instances, where the vice has been long indulged in, half a pint to a pint is the quantity taken. These facts should be borne in mind by the medical practitioner, as opium-eaters when labouring under disease require of course very large doses of the drug; and in all individuals, where the use of opium has been continued for any length of time, the dose must be gradually increased. We also occasionally meet with individuals on whom, although unaccustomed to its use, opium produces but little effect. Christison mentions an instance of "a gentleman of his acquaintance, who, though not accustomed to its use, has taken 450 drops of the best laudanum without any other effect than some head-ache and constipation; and singularly enough, his son at the age of six, took 60 minims of solution of muriate of morphia without any apparent effect." In others, we see a very opposite state of sensibility to the operation of this drug, the sixth or eighth of a grain being a sufficient dose; this extreme sensibility to the action of opium is always met with, in infants and young children; we should therefore employ opiates with great caution in the treatment of their diseases, one drop of laudanum frequently proving a dangerous

dose to a child a few weeks old. The effects of opium are also much influenced by disease, as will be evident when we come to speak of the special uses of the drug. Lastly, by combination with other remedies the operation of opium is greatly modified. Thus, with antimonials, or ipecacuanha, its narcotic influence is much diminished, and the diaphoretic powers of these substances remarkably increased; with astringents, as catechu, kino, or chalk, their powers are augmented without the production of narcotism; and with aromatics or camphor, the stimulant effect of the drug is in general only manifested.

The special uses of opium in the treatment of disease are so very numerous, that we can only subjoin a concise account of the most important of them; mentioning the peculiar circumstances by which its employment is demanded, or contra-indicated. In *fevers*, opium is principally used to procure sleep where there is great watchfulness or delirium present, without excitement of the vascular system, or where they continue, after that excitement has been subdued by antiphlogistic treatment. Its use, however, must be attended with great caution, and should not be persisted in, if the tongue and skin become dry, or if the pupil of the eye be contracted. The combination of tartar emetic with opium, as first proposed by Dr. Graves of this city, will be often found particularly useful in fevers attended with much cerebral disturbance. In the *eruptive fevers*, opium when given with due attention to the concomitant symptoms is productive of much benefit, nay, is sometimes imperatively demanded for the safety of the patient; about the eighth or ninth day of the eruption in small-pox, great cerebral disturbance frequently comes on, at first marked by throbbing of the carotids; if opium be not administered immediately on the appearance of this symptom, it is quickly followed by delirium, coma, and death. In *intermittent fever*, opium given in a large dose at the commencement of the cold stage frequently arrests the paroxysm; if there be any local inflammation or congestion present, its use is contra-indicated. In *inflammatory diseases*, given in conjunction with calomel, it acts as a powerful antiphlogistic; one grain of opium with two or three of calomel administered every four or five hours, will be often found a remedy of much power in the inflammations of *membranous* parts; it does not, however, prove so useful in the inflammation of the *parenchymatous structure* of organs. In *diffuse inflammation*, particularly that fatal form of it, which is accompanied with *periostitis*, opium proves more successful than any other remedy which has been employed; it is best given alone in doses of from a quarter of a grain to half a grain every hour or every second hour. Its beneficial influence in this affection depends upon its power of lessening "irritability," and thereby enabling the system to bear up against the disease. After a copious bleeding, at the very commencement of an acute attack of *gastritis, enteritis, peritonitis, cystitis*, &c., a full opiate, 60 to 80 drops of the tincture, or from 2 to 3 grains of solid opium, will often arrest the further progress of the disease. In *peritonitis* caused by rupture of the stomach or intestinal canal, life can only be prolonged for even a short period by the use of very large doses of opium. In *rupture of the uterus*, given immediately and freely opium has in some instances saved the life of the patient; in the treatment of

uterine hemorrhage it also proves very beneficial, even when the bleeding proceeds from organic disease. In *acute rheumatism*, when given as first proposed by Dr. Corrigan, it is productive of the happiest results; to prove useful in this disease, it must, however, be administered freely, one grain at first every second hour, and after a few doses every hour, and this treatment continued for five or six days, or until the disease is subdued; thus given, it does not cause either dryness of the tongue, head-ache, or constipation; the duration of the attack is shortened; and the dangerous complications of endocarditis and pericarditis to a great extent prevented. In the early stages of *acute dysentery*, opium given in full and frequently repeated doses will be found in general to check the disease; the same may be also stated of *diarrhœa, aud common cholera*. To allay the pain of *gout* and *chronic rheumatism*, it is given in full doses with much advantage. In *delirium tremens*, opium is the remedy on which most reliance is to be placed; to prove beneficial, it should be employed in very large doses frequently repeated, thus two or three grains of solid opium must be administered every third or fourth hour. The addition of tartar-emetic to the opium as proposed by Professor Law of this city, will be generally found productive of benefit in cases of delirium tremens where opium alone fails to do good. It is more beneficial in *hydrophobia* and *tetanus* than any other agent which has been yet employed; in these diseases there is a remarkable insensibility to the action of the drug, so that it must be given in enormous doses to procure any good result. In *spasmodic* and *convulsive* diseases, opium is also a highly important remedy; as in spasm of the ureter, or gall duct from the passage of calculi, in spasmodic stricture, in colic, &c. In all the varieties of neuralgia or other painful affections; in the nervous irritability which follows large losses of blood; in senile gangrene; in cancer; in painful ulcerations; in poisoning with acrid or corrosive substances, &c., opium is very generally employed as a palliative and anodyne. It has been also found a most useful adjunct to animal diet in the treatment of *diabetes*. And lastly in *venereal diseases* it is combined with mercurials to prevent them from running off by the bowels. *Externally* opium is used in the form of infusion, liniment or plaster; the uses of the two latter will be described amongst the pharmaceutical preparations of the drug. The infusion is applied to recent burns, or inflammations of the skin from other causes; a solution of gr. xij. each of powdered opium, and of acetate of lead, infused separately in f℥iv. of tepid water and mixed and filtered, forms an excellent lotion in these cases, and also in erythema and erysipelas. In *chronic ophthalmia*, or where the inflammation is of a subacute character from the commencement, the wine of opium dropped into the eye is found an excellent remedy. Suppositories of opium are introduced into the rectum in tenesmus and in painful or spasmodic affections of the neighbouring viscera.

Dose and Mode of Administration.—In powder gr. ss. to gr. iij. or gr. iv. usually given in the form of pill, which may be made with simple mucilage, or, if they are to be kept for any time, conserve of roses.—*Extractum Opii aquosum*, D. *Extractum Opii purificatum*, L. *Extractum Opii*, E. ("Opium sliced, ℥ij.; boiling water, *by measure*

℔j.; triturate the opium with the water for 10 minutes, and after a short interval pour off the liquor; triturate the residual opium with an equal quantity of boiling water, and for the same time, pouring off the liquor as before; repeat the process a third time; mix the liquors, and expose the mixture to the air for two days in an open vessel. Lastly, strain through linen, and prepare an extract with slow evaporation," D. —"Opium, sliced, ℥xx.; boiling distilled water, cong. j.; Add a little water to the opium, and macerate for 12 hours, that it may soften; then the remaining water being poured in gradually, rub them until they are very well mixed, and set by that the dregs may subside; afterwards strain the liquor, and evaporate to a proper consistence," L.—"Opium, ℔j.; water, Ov.; cut the opium into small fragments, macerate it for 24 hours in a pint of water, break down the fragments with the hand, express the liquid with pretty strong pressure; break down the residuum again in another pint of water, let it macerate for 24 hours, and express the liquid; repeat the maceration and expression in the same way till the water is all used. Filter the successive infusions as they are made, passing them through the same filter; unite and evaporate them in the vapour-bath to the proper consistence," E.). A very bad preparation, and one which should be expunged from the pharmacopœias; during the prolonged evaporation, the morphia forms a very insoluble compound with the resinoid matter of the opium, which must of course tend to lessen the activity of the drug. It is administered in the same doses as the powder.—*Pilulæ Opii sive Thebaicæ*, E. (Opium, 1 part; sulphate of potash, 3 parts; conserve of red roses, 1 part; beat them into a proper mass, and divide into five grain pills). Each pill contains gr. j. of opium. Dose, one to three pills. The sulphate of potash is merely used as a mechanical agent, to divide the opium.—*Pilulæ Saponis cum Opio*, D. *Pilulæ Saponis compositæ*, L. (Turkey (hard, L.) opium, (powdered, L.), ℥ss.; hard soap, ℥ij.; beat them together until they are incorporated). Five grains contain one grain of opium. Dose, gr. iij. to gr. x.—*Pilulæ e Styrace*, D. *Pilulæ Styracis*, E. *Pilulæ Styracis compositæ*, L. (Storax, (purified, L. the extract, E.), ℥iij. (2 parts, E.); opium (Turkey, D. hard, in powder, L.); saffron, of each, ℥i. (1 part, E.); beat them into a uniform mass; "and divide into four grain pills," E.). Every five (four, E.) grains contain one grain of opium. The storax and saffron completely conceal the odour and taste of the opium, and the name enables us to prescribe that drug without the knowledge of our patient.—*Confectio Opii*, D. L. *Electuarium Opii*, E. ("Hard opium, powdered, ℥vj.; long pepper, ℥i.; ginger, ℥ij.; caraway seeds, ℥iij.; tragacanth, powdered, ℥ii; syrup, ℔i. (f℥xvi., L.)," D. L. "Rub the opium with the syrup previously heated; then add the other ingredients in powder, and mix," D. "Rub the dry ingredients together to a very fine powder, and keep it in a close vessel; and whenever the confection is to be used, add the syrup made hot, and mix," L.—"Aromatic powder, ℥vj.; seneka, in fine powder, ℥iij.; opium, diffused in a little sherry, ℥ss.; syrup of ginger, ℔j.; mix them together, and beat them into an electuary," E.). About 25 grains (26 grains, L. 43 grains, E.) contain gr. j. of opium. It is an aromatic and anodyne compound, chiefly used as an addition to chalk mixture in diar-

rhœa. Dose, gr. x. to ʒj.—*Trochisci Opii*, E. (Opium, ʒij.; tincture of tolu, ʒss.; syrup, fʒviij.; powder of gum arabic; and extract of liquorice, softened with boiling water, of each, ʒv.; reduce the opium to a fluid extract by the formula for *Extractum Opii*, mix it intimately with the liquorice previously reduced to the consistence of treacle; add the tincture, sprinkle the gum and sugar into the mixture, and beat it into a proper mass, which is to be divided into lozenges of ten grains). Seven lozenges contain about gr. j. of opium; they are principally employed to allay troublesome cough.—*Tinctura Opii*, D. L. E. ("Turkey (hard L.) opium, powdered (coarsely, D.), ʒx. (ʒiij. L.); proof spirit, *by measure* ℔j. (Oij. L.); macerate for 14 days and filter," D. L.—"Opium sliced, ʒiij.; rectified spirit, Oj. fʒvij.; water, fʒxiiiss.; digest the opium in the water at a temperature near 212° for two hours, break down the opium with the hand, strain and express the infusion, macerate the residuum in the spirit for about 20 hours, and then strain and express very strongly, mix the watery and spirituous infusions and filter. This tincture is not so easily obtained by percolation, but when the opium is of fine quality, it may be prepared thus: slice the opium finely, mix the spirit and water, let the opium macerate in fʒxiv. of the mixture for 12 hours and then break it down thoroughly with the hand, pour the whole fluid and pulpy mass into a percolator, and let the fluid part pass through, add the rest of the spirit without packing the opium in the cylinder, and continue the process till Oij. are obtained," E.). The tincture of opium, *laudanum*, of the three pharmacopœias is about the same strength; according to Christison, min. xiiiss., or about 25 drops, contain the active part of one grain of opium. It is the most generally employed of the preparations of opium, the spirituous menstruum dissolving all the active principles of the drug, and enabling us to apportion our doses with great accuracy. Dose, min. x. to min. xxx.—*Tinctura Opii Camphorata*, D. E.—*Tinctura Camphoræ composita*, L.—*Paregoric elixir*. ("Turkey (hard, L.) opium, powdered; benzoïc acid, of each, ʒj. (gr. lxxij. L.); camphor, ϑij. (ϑiiss. L.); oil of anise, fʒi.; proof spirit, *by measure* ℔ij. (Oij. L.); macerate for 14 days and filter," D. L.—"Opium sliced; and benzoïc acid, of each, ϑiv.; camphor, ϑiiss.; anise-oil, fʒj.; proof spirit, Oij.; digest for seven days and filter," E.). The name adopted by the London College for this preparation is the most convenient, as it enables us to prescribe opium without the knowledge of our patient; it also serves to distinguish it better from the simple tincture, and thus prevent errors in dispensing. According to Christison, the active matter of one grain of opium is contained in 267 minims or about 500 drops of the preparation of the Dublin and London Pharmacopœias, and in 240 minims or about 450 drops of that of Edinburgh. It is very much employed as an anodyne in pectoral affections unaccompanied with inflammation. Dose, fʒj. to fʒiij.—*Acetum Opii*, D. E. (Opium (Turkey, D.), ʒiv.; distilled vinegar, ℔j. (fʒx. E.); triturate the opium (cut into small fragments, E.), into a pulp with a little of the vinegar, then add the remainder of the vinegar, macerate in a close vessel for 7 days, frequently agitating, then pour off the supernatant liquor (strain and express strongly, E.), and filter). This preparation of opium is preferred by many to laudanum, as being less apt to occasion the disa-

greeable subsequent effects of the drug. According to Montgomery, twenty drops are equivalent to thirty of the common tincture of opium. Dose, min. viij. to min. xxv.—*Tinctura Opii Ammoniata,* E. (Benzoïc acid; and saffron, chopped, of each, ʒiij.; opium, sliced, ʒij.; anise-oil, ʒss.; spirit of ammonia, Oj.; digest 7 days and filter). This preparation is called in Scotland, *Scotch Paregoric;* it is used as an anodyne and antispasmodic. The active matter of one grain of opium is contained in 80 minims or about 150 drops, (Christison). Dose, fʒss. to fʒij.—*Vinum Opii,* D. L. E. (Opium (purified extract of opium, L.), ʒj. (ʒiiss. L., ʒiij. E.); cinnamon, bruised (in moderately fine powder, E.); and cloves bruised, of each, ʒj. (ʒiiss. L. E.); sherry wine, ℔j. (Oij. L. E.); macerate (digest, E.), for 8 (14, L., 7, E.) days and filter). This preparation is more agreeable both in smell and taste than laudanum; it is, however, seldom employed internally, being chiefly used as an application to the eye in chronic ophthalmia. The active matter of one grain of opium is contained in min. xvij. of the Dublin wine, in a trifle more of the Edinburgh, and in min. x. of the London. Dose, for internal use, min. x. to fʒj.—*Enema Opii,* D. L. E. ("Tincture of opium, ʒi.; tepid water, ʒvi.; mix," D.—"Decoction of starch, fʒiv.; tincture of opium, min. xxx.; mix," L.—"Starch, ʒss.; tincture of opium, fʒss. to fʒi.; water, fʒij.; boil the starch in the water, and when it is cool enough for use add the tincture of opium," E.). Used as an anodyne in irritable states of the bowels; the bulk of the Dublin preparation is too great, as the smaller quantity of fluid is less likely to be expelled; starch is also a better vehicle than water. On the Continent it is generally stated that opium acts much more energetically when administered in the form of enema, than when given by the mouth; but the contrary opinion is held by British practitioners, who generally employ three or four times the quantity when administered by the rectum.—*Linimentum Opii,* L. E.—*Linimentum Saponis cum Opio,* D. ("Soap liniment, *by measure* 4 parts (fʒvi. L.); tincture of opium, 3 parts (fʒij. L.); mix," D. L.—"Castile soap, ʒvj.; opium, ʒiss.; camphor, ʒiij.; oil of rosemary, fʒvj.; rectified spirit, Oij.; macerate the soap and opium in the spirit for three days, filter, add the oil and camphor and agitate briskly," E.); *Anodyne liniment,* used as an embrocation in rheumatic pains, neuralgia, &c.—*Emplastrum Opii,* D. L. E. (Opium (hard, L.), in powder, ʒss.; burgundy pitch (resin of the spruce fir, L.), ʒiij.; litharge (lead, L.) plaster, ℔i.; (water, fʒviij. L.); "melt the plaster, add the pitch and opium by degrees and mix them thoroughly," D. E. "Add the resin, opium and water to the melted plaster, and with a slow fire, boil down until all unite into a proper consistence," L.). This plaster contains about a thirtieth part of opium. It is used as an anodyne application in local pains.—*Black drop,* (Opium sliced, ℔ss.; expressed juice of the wild crab, Oiij.; nutmegs, bruised, ʒiss.; saffron, ʒss.; boil to a proper consistence, then add, of pure sugar, ʒiv.; yeast, two spoonsful; set the whole in a warm place near the fire for six or eight weeks, then place it in the open air until it becomes a syrup; and lastly, decant, filter, and bottle it, adding a little sugar to each bottle). This preparation resembles the officinal *Acetum Opii;* it is highly prized by many practitioners, and is said not to produce the disagreeable subsequent effects of most

of the other preparations of the drug. It is more than twice the strength of laudanum.—*Liquor Opii Sedativus*, Cooley. (Dry opium, in powder, 1 part; clear washed sand, 2 parts; mix and moisten with water; put the mass into a percolator and pass distilled water, heated to 70° F. through the ingredients till it passes both tasteless and colourless. Evaporate the liquor over the water-bath to the consistence of a hard pill extract. Take of this extract, ʒiij.; distilled water, fʒxxx.; boil for two minutes, let it cool and filter; then add of rectified spirit fʒvj., and distilled water, a sufficiency to make up Oij.). It is about the same strength as laudanum, than which it is said to be less stimulating.

Incompatibles.—The alkalies, and lime water, unless they are added in excess; the carbonates of the alkalies; acetate and diacetate of lead; sulphates of iron, copper, and zinc; arsenite of potash; corrosive sublimate; and all astringent vegetable preparations.

In cases of poisoning with opium, we should immediately have recourse to the use of the stomach pump and stimulating emetics; to external stimulants, such as cold affusion, loud talking, compelled exertion as forcing the patient to walk between two assistants, the application of ammonia or strong acetic acid to the nostrils, &c.; to internal stimulants, the best of which are brandy, ammonia and its carbonate, strong coffee, camphor and musk; and if all other remedies fail, artificial respiration and galvanic shocks should be had recourse to, the assiduous application of which, has in some almost hopeless cases restored life; in one instance on record, artificial respiration was kept up for nearly three hours.

Papaver, L. E. Papaver somniferum, capsulæ maturæ, D. *Poppy-heads. The ripe (not quite ripe,* E.*) capsules of Papaver somniferum.* This plant has been described in the last article; the heads are most active when gathered before they are ripe as directed by the Edinburgh College; they are dried in the sun.

Physical Properties.—They are globular, about the size of an apple, crowned with the persistent, many rayed stigma; their structure is thin and fragile; they have a feeble narcotic odour, and a weak somewhat bitter taste. They contain many bland seeds, which yield by expression a yellowish fixed oil.

Chemical Properties.—Poppy-heads contain a very minute proportion of the different substances found in opium, with a large quantity of woody fibre. They yield their virtues to boiling water.

Therapeutical Effects.—Any medicinal virtues which poppy-heads possess, depend on the presence of a small quantity of opium, consequently they are apt to vary much in strength. They are chiefly used in the form of decoction as a fomentation to inflamed or painful parts. The following officinal preparations are sometimes used internally as substitutes for opium.—*Extractum Papaveris,* L. E. (Poppy-heads without seeds, (bruised, L.), ʒxv.; boiling water, (distilled, L.), cong. j.; macerate for 24 hours, then boil down to 4 pints, strain the liquor (while hot, L.), and evaporate (in the vapour bath, E.), to the due consistence). Its effects are somewhat similar to those of opium; it is but

rarely used. Dose, gr. ij. to gr. xx.—*Syrupus Papaveris* (*somniferi*, D.), D. L. E. (Poppy-heads (without the seeds, E., and bruised, D.), ℥xvij. (℔iij. L., ℔iss. E.); boiling water, cong. ij. (cong. v. L., Oxv. E.). "Macerate for 24 hours in the water, then boil down to cong. j. in a water bath and express strongly, reduce the strained liquor to ℔ij., and strain while hot. Set aside for 12 hours that the feces may subside, boil down the clear liquor to ℔j. and make into a syrup," D. "Boil down the capsules in the water to cong. ij., and press strongly; boil down the strained liquor again to Oiv., and strain while hot, set it by for 12 hours that the dregs may subside, then boil down the clear liquor to Oij.; add ℔v. of sugar and dissolve it," L. "Slice the poppy-heads and infuse them for 12 hours in the water, boil down to Ov., strain and express strongly through calico; boil again to Oiss., then add ℔iij. of sugar, and dissolve it with the aid of heat," E.). Syrup of poppies is usually employed as a narcotic in infantile diseases; it should be administered to infants and children with great caution, as Dr. Montgomery states that in more than one instance a teaspoonful has proved fatal to a healthy infant; this care is particularly requisite, as a preparation made by adding laudanum to simple syrup is frequently substituted for the true syrup. Dose, for infants and children, f℥ss. to f℥ij.; for adults, f℥ss. to f℥j.—*Decoctum Papaveris*, D. L. E. (Poppy-heads sliced, ℥iv.; water, *by measure* ℔ij. (Oiv. L., Oiij. E.); boil for a quarter of an hour and strain). For external use only.

Rhoeas, L. Rhoeados petala, E. Papaver rhoeas, petala, D. *The petals of Papaver rhœas, the Red or Corn-poppy.* Indigenous; belonging to the Natural family *Papaveraceæ*, and to the Linnæan class and order *Polyandria Monogynia.*

Botanical Characters.—A slender annual, 2-3 feet high; Stem, bristly, many flowered, its bristles and those of the flower stalks spreading; Leaves, pinnatifid; Flowers, with broad, deep scarlet petals; Capsules glabrous, nearly globose.

Properties.—The petals should be collected immediately after their expansion as they drop off easily; they should be dried quickly, so as to preserve their colour. In the recent state, red poppy petals are of a rich scarlet colour, which becomes darker by drying; they have a feeble odour of opium, and a slightly bitter taste. They consist of vegetable albumen, red colouring matter, astringent matter, soft resin, wax, gum, and some salts, (Beetz and Ludurg). It is probable that they also contain a trace of morphia. They yield their colouring matter aud other principles to boiling water.

Therapeutical Effects.—The petals of the red poppy probably possess some feeble narcotic properties, but they are only used in medicine in the form of syrup, as colouring ingredients, in consequence of their fine rich colour.—*Syrupus Papaveris Rhœadis*, D.—*Syrupus Rhœados*, L. E. ("Fresh petals of the red poppy, ℔j.; boiling water, *by measure* ℥xx.; add the petals gradually to the boiling water, remove

the vessel from the fire, and macerate with a low heat for 12 hours, then express the liquor and set it aside that the dregs may subside; finally, add sugar and form a syrup," D.—"Red poppy (petals), ℔j.; boiling water, Oj.; pure sugar, ℔iiss.; add the petals gradually to the water heated in a water-bath, stirring occasionally; then the vessel being removed from the bath, macerate for 12 hours, then (strain, E.) press out the liquor, and (when the dregs have subsided, L.), add the sugar and dissolve it," L. E.). This syrup does not keep well.

STRAMONIUM, E. DATURA STRAMONIUM, HERBA, SEMINA, D. STRAMONII FOLIA ET SEMINA, L. *Stramonium. Thorn-apple. The herb,* E.—*The herb and seeds,* D.—*The leaves and seeds,* L.—*of Datura stramonium.* Indigenous; belonging to the Natural family *Solanaceæ,* and to the Linnæan class and order *Pentandria Monogynia.*

BOTANICAL CHARACTERS.—A herbaceous annual; Stem, much branched, forked, spreading, leafy; Leaves, ovate, angulato-sinuate, glabrous; Flowers, axillary, large, erect, white; Fruit, an ovate capsule, erect, clothed with numerous nearly equal spines, 4 celled at the base, 2 celled at the summit, many seeded.

PREPARATION.—The whole herb should be collected when the plant is in flower, and carefully dried as quickly as possible with a gentle heat. The leaves should be removed from the stem and branches which are to be rejected. The seeds when fully ripe are black, and should be then gathered.

PHYSICAL PROPERTIES.—As usually met with, the dried herb is chopped into small pieces; it is of a greenish-white colour, and has a feeble narcotic odour (which in the fresh state is strong and heavy), and a bitter nauseous taste. The seeds are small, kidney-shaped and rough; when bruised they have the same odour as the herb; their taste is nauseous and bitter.

CHEMICAL PROPERTIES.—The seeds contain fixed oil, wax, resin, extractive, gummy matter, malic acid, some salts, and a peculiar alkaloid, first discovered by Brandes, and named by him *Daturia,* but which has been since shown by Runge to be identical with *Atropia* (see pages 213 and 218). It is on this principle that the medicinal properties of stramonium depends; it exists also in the leaves. Both herb and seeds yield their virtues to water and to alcohol; but their activity is much impaired by long boiling, as in preparing the watery extract.

THERAPEUTICAL EFFECTS.—Stramonium leaves and seeds act as powerful narcotics, in large doses proving fatal with all the symptoms of narcotic poisoning. In medicinal doses, as might be expected from the identity of their active principles, they produce effects nearly similar to those of belladonna and henbane, and have been consequently used with the same intention in the treatment of disease. In neuralgic affections as *tic douloureux* and *sciatica,* in chronic rheumatism, and in all forms of chronic disease attended with acute pain, administered in small doses frequently repeated until its narcotic influence is manifested, stramonium is a remedy of great power, lessening almost immediately sensibility and pain. The inhalation of the vapour of the cut herb when burned, is

frequently found of much service in the treatment of spasmodic asthma; it is used with a common pipe in the same way as tobacco, or in the form of cigar prepared by rolling the leaf. The smoking of stramonium, however, should be employed with great caution, and used only in very small quantities at a time, as in many instances it has produced dangerous symptoms; and it should never be prescribed for very old persons, or in cases where there is a tendency to apoplexy or to paralysis.

Dose and Mode of Administration.—Of the powder of the herb or leaves, gr. j. to gr. iv.; of the seeds, gr. $\frac{1}{4}$. to gr. j., gradually increased until some obvious effect is produced. For smoking, gr. x. to gr. xx. of the chopped herb may be used, but the patient should be directed to allow an interval of at least three minutes to intervene between each inhalation of the smoke, whether a common pipe or a stramonium cigar be employed; and the effects caused by it must be carefully watched.—*Extractum Stramonii,* D. L. E. ("Stramonium seeds, ℔j. (℥xv. L.); boiling (distilled, L.) water, cong. j.; digest (macerate, L.) for 4 hours in a vessel lightly covered (near the fire, L.), then take out the seeds, bruise them in an earthen mortar, and when bruised return them to the liquor; then boil down to ℔iv. (Oiv. L.); strain the liquor (while hot, L.), and evaporate to a proper consistence," D. L.—"Take of stramonium seeds any convenient quantity, grind them well in a coffee mill, rub the powder into a thick mass with proof spirit, put the pulp into a percolator and transmit proof spirit till it passes colourless; distil off the spirit and evaporate what remains in the vapour bath to a proper consistence," E.). This extract is best prepared according to the directions of the Edinburgh Pharmacopœia, being more certain as well as more active. Dose, gr. $\frac{1}{4}$., gradually increased.—*Tinctura Stramonii,* U. S. (Stramonium seeds, bruised, ℥iv.; proof spirit, ℥xxxij.; macerate for 14 days, express, and filter through paper. This tincture may also be prepared by thoroughly moistening the stramonium seed, in powder, with diluted alcohol, allowing it to stand for 28 hours, then transferring it to an apparatus for displacement, and gradually pouring upon it diluted alcohol until two pints of filtered liquid are obtained.) An excellent preparation. Dose, min. x. to min. xxx.

Incompatibles.—The mineral acids; caustic alkalies; and the salts of iron, lead, mercury, and silver.

In poisoning with stramonium, the same treatment should be employed as in poisoning with belladonna.

Toxicodendron, L. Rhus toxicodendron, folia, D. *Sumach or Poison-oak leaves; The leaves of Rhus toxicodendron.* A native of North America; belonging to the Natural family *Anacardiaceæ,* and to the Linnæan class and order *Pentandria Trigynia.*

Botanical Characters.—A small shrub; Stems, numerous, branching; Leaves, pinnate, trifoliate; Flowers, greenish-white.

Physical Properties.—The leaves and branches in the recent state

abound in an acrid milky juice which becomes black on exposure to the air; so acrid is this juice that even the emanations from the shrub will in some persons produce heat, redness, and sometimes erysipelatous inflammation, if they are exposed to its influence. In the dry state the leaves have no odour; they have a weak somewhat acrid taste.

Chemical Properties.—No chemical analysis has been made of this plant, the milky juice probably contains a volatile narcotico-acrid principle. In the dry state, the usual tests indicate the presence of tannin, gallic acid, and resinous extractive.

Therapeutical Effects.—In large doses toxicodendron acts as a narcotico-acrid poison. It has not been much employed in medicine, as the leaves are nearly inert in the dry state owing to the volatility of their active principle. They were at one time much vaunted as a remedy for paralysis, particularly paraplegia, in cases where the disease was supposed to depend on a torpid condition of the nerves.

Dose and Mode of Administration.—Of the powdered leaves, gr. j. to gr. v., three or four times a day.—*Tinctura Toxicodendri*, (Toxicodendron leaves, ℥j; rectified spirit, f℥xij.; distilled water, f℥iv.; mix, digest for six days and filter). Dose, f℥ss. to f℥j. three times daily.

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# CHAPTER XVI.

## REFRIGERANTS.

### (Temperants).

Refrigerants are medicines calculated to diminish the heat of the body when morbidly increased, and to produce a sensation of coolness. Actual experiment has proved that such substances when taken into the stomach, although they cause a sensation of cold over the whole body, do not really diminish the temperature; consequently it has been hitherto found impossible to explain satisfactorily the phenomena which follow their internal use. Applied externally in the form of cooling, or evaporating lotions to inflamed parts, their mode of operation is readily understood, the temperature of the part to which they are applied being actually lowered. The principal use of refrigerants in the practice of medicine, is in the treatment of febrile and inflammatory affections, in which the benefit they produce appears to depend on the fact, that their direct action on the stomach occasions sympathetically a transient reduction in the force of the circulation. During their administration also, irritability is allayed, and the morbid sensations of heat, thirst, and nausea are diminished.

Acetosella, L. *Woodsorrell. Herb of Oxalis acetosella.* An indigenous plant; belonging to the Natural family *Oxalidaceæ,* and to the Linnæan class and order *Decandria Pentagynia.*

Botanical Characters.—A small herbaceous plant; Leaves, radical, ternate, on long, slender, reddish leafstalks; Leaflets, inversely heart-shaped, hairy; Scape, single flowered; Flowers, drooping, white with purplish veins.

Properties.—Woodsorrel is odourless, but has an agreeable acid taste. Its only important constituent is b noxalate of potash, of which it contains from 1·06 to 1·23 per cent; it yields its properties to boiling water.

Therapeutical Effects.—This herb, infused in boiling water, forms an agreeable refrigerant drink in febrile disorders; in the present day it is only used as a domestic remedy, and might be well spared from the Materia Medica.

Acetum. *Vinegar* (described in the division *Astringents),* is a useful refrigerant in febrile or inflammatory affections. It is not much employed as such internally, nevertheless f℥ss. to f℥j. diluted with f℥xx. of water forms a cooling drink, and may be taken *ad libitum* in cases where its astringent property is not objectionable. As an external refrigerant, its action is attended with much benefit in the treatment of most febrile and inflammatory diseases; it should be applied by means of a sponge to the surface of the body; to form a solution for this purpose, f℥j. is mixed with f℥iij. of cold or tepid water according to circumstances. For internal use the simple oxymel of the Dublin and London Pharmacopœias is well adapted, or the following preparation may be used:—*Syrupus Aceti,* E. (Vinegar, French in preference, f℥xj.; pure sugar, ℥xiv.; boil them together). Dose, f℥ij. to f℥i. as an adjunct to other medicines.

Acidum citricum, D. L. E.—*Citric acid.*

Preparation, D. L. E.—Lemon juice, as much as may be required (Oiv. L. E.); prepared chalk, a sufficiency (℥ivss. L. E., or a sufficiency, E.); dilute sulphuric acid, eight times the weight of the chalk used (f℥xxvijss. L., f℥xxxvi., or in the same proportion to the chalk required, E.); (distilled water, Oij. L.); "Add the chalk gradually to the lemon juice made hot, and as soon as the citrate of lime has subsided, pour off the supernatant liquor; wash the citrate frequently with warm water, (and dry it, D.); then pour upon it the diluted sulphuric acid (and the distilled water, L.), and boil (for a quarter of an hour, L.). Press the liquor strongly through linen and strain it; evaporate the strained liquor (with a gentle heat, L.), and set it by that crystals may be formed; dissolve the crystals, that they may be pure, again and a third time in water (strained each time, L.), and crystallize," D. L. "Boil the lemon juice, let it rest, pour off the clear liquor, boil this again, and add the chalk to it while hot by degrees, till there is no more effervescence, and the liquid ceases to taste acid. Collect the precipitate and wash it with hot water till the water passes colourless, squeeze the residuum in a powerful press; mix it uniformly with Oij. of distilled water, and then add the sulphuric acid by degrees and with constant stirring. Try whether a small portion of the liquid, when filtered, gives with solution of nitrate of baryta a precipitate almost entirely soluble in nitric acid; and if the precipitate is not nearly all soluble, add a little citrate of lime to the whole liquor till it stand this test. Separate now the clear liquor by subsidence

or filtration, washing the insoluble matter with cold water, and adding the washings to the liquor; concentrate with a gentle heat till crystals form on the surface, set the liquor aside to cool and crystallize, and purify the crystals by repeated solution and crystallization till they are colourless," E.

Physical Properties.—Citric acid crystallizes in transparent, colourless, regular rhomboidal prisms, terminated by four trapezoidal faces. They are inodorous, but have an agreeable, purely acid taste. Sp. gr. 1·617.

Chemical Properties.—Crystalline commercial citric acid consists of, $C^{12}\ H^{5}\ O^{11} + 4\ HO$, but on cooling a saturated solution at 212°, it crystallizes with two equivalents less of water. The crystals are permanent in the air; heated at 212° they part with their water of crystallization, and at a higher temperature are decomposed; 100 parts of citric acid are soluble in 75 parts of cold, or 50 of boiling water; the solution undergoes decomposition when kept even in close vessels, and becomes covered with mould. When pure, the crystals dissolve completely in alcohol. Citric acid is readily distinguished by the following characteristic; when a few drops of a solution of the acid are added to lime water, a clear liquid results which on being heated becomes turbid, from the deposition of a white precipitate.

*Adulterations.*—Citric acid is liable to be adulterated with sulphuric or tartaric acid, sulphates, tartrates, and lime. The presence of sulphuric acid or the sulphates is detected by adding acetate of lead to a solution of the acid, if the impurity be present, the precipitate occasioned is not dissolved by nitric acid. The presence of tartaric acid or the tartrates is shewn by a crystalline precipitate being formed, on the addition of carbonate of potash dissolved in water, to a solution of the acid in excess. Lime or any other fixed impurity is detected by incinerating the acid with the aid of a little red oxide of mercury; if it be pure, no ash or a mere trace will be left.

Therapeutical Effects.—Citric acid produces the refrigerant effects of lemon-juice, as a substitute for which it may be employed to form cooling drinks in febrile affections, but fresh lemon-juice should be preferred whenever it can be obtained.

Dose and Mode of Administration.—℈i. to ʒi. To prepare a solution of the same strength as lemon-juice, ʒviiiss. of the acid are to be dissolved in fʒxvj. of water. Citric acid is also employed to form effervescing draughts with the alkaline carbonates; gr. xx. of the acid are saturated by about gr. xxix. of crystalline bicarbonate of potash, or gr. xlj. of crystalline carbonate of soda, or gr. xxiv. of sesquicarbonate of soda, or gr. xvij. of hydrated sesquicarbonate of ammonia.

Incompatibles.—The alkalies; carbonates; acetates; the alkaline and earthy sulphurets; and tartrate of potash.

### Acidum oxalicum. *Oxalic acid.*

Preparation.—It is prepared on the large scale as an article of commerce for use in the arts, by the action of nitric acid on treacle or potato starch. For use in medicine it may be further purified by dissolving it in water and re-crystallizing.

Physical Properties.—Oxalic acid crystallizes in four-sided oblique prisms with dihedral summits; it is odourless but has a very acid taste. Sp. gr. 1·50.

Chemical Properties.—It is composed of 2 eq. of carbon and 3 of oxygen, combined in the crystalline state with 3 of water ($C^2$ $O^3$ + 3 HO). The crystals effloresce in the air and lose two equivalents of their water of crystallization; exposed to a temperature of 354° F. they melt, and are partly decomposed, one portion subliming and the other being converted into carbonic oxide, carbonic acid, and formic acid. Oxalic acid is very soluble in water and in alcohol; it also dissolves unchanged in dilute nitric and sulphuric acids. The watery solution reddens litmus paper, and decomposes the carbonates with effervescence. The best characteristic of nitric acid is the action of nitrate of silver on its solution: it produces a white precipitate, soluble in nitric acid, which, when heated over the flame of a spirit lamp, detonates feebly.

Therapeutical Effects.—Oxalic acid is a powerful poison, when taken in large doses or in a concentrated solution acting as a corrosive, while a weak solution produces death with marked symptoms of depression of the circulation and of the nervous system.* It is but rarely used as a medicine in this country, but on the continent it is employed as a refrigerant in the form of lemonade. From the results of the experience of M. Nardo, who has used this acid very extensively, it is to be preferred to the other vegetable acids as a refrigerant and antiphlogistic in all acute inflammations of mucous membranes, more especially when the stomach is the seat of the disease.

Dose and Mode of Administration.—From gr. j. to gr. ij. dissolved in fʒi. or fʒij. of water. Gr. x. give an agreeable acidity to Oj. of water, and half of this quantity may be taken in the 24 hours. The solution may be sweetened with sugar, if preferred. In poisoning with this acid, chalk, whiting or magnesia suspended in water should be *at once* administered, and vomiting *afterwards* excited by emetics or by the use of the stomach pump.

## Acidum tartaricum, D. L. E.—*Tartaric acid.*

Preparation.—*Dub.*—" Bitartrate of potash, in powder, 10 parts; prepared chalk, 4 parts; sulphuric acid, 7 parts; water, 120 parts; mix the bitartrate of potash with 100 parts of water heated, add gradually the chalk, and as soon as the effervescence has ceased, pour off the clear liquor; wash the residual tartrate of lime until it becomes tasteless. Drop into the clear decanted liquor as much of the water of muriate of lime as may be sufficient to throw down the tartrate of lime; wash this also with water till it becomes tasteless, and mix it

* Poisoning with oxalic acid most frequently occurs, in consequence of its being mistaken for sulphate of magnesia, to which it bears much resemblance. It may be readily distinguished from the latter by pouring a few drops of common writing ink on the crystals, which is changed to a reddish-brown colour by oxalic acid, but no effect produced on it by sulphate of magnesia. The solution, also, of Epsom salts tastes nauseous and bitter while that of oxalic acid is purely and intensely acid, but not at all bitter.

with the former deposit. Then add the sulphuric acid diluted with 20 parts of water, and digest the mixture with a medium heat for 3 days, frequently agitating. Pour off the supernatant acid liquor, and wash away the acid from the sediment. Evaporate these liquors, including the first acid liquor and the washings, with a gentle heat to the point of crystallization; preserve the crystals purified by repeated solutions and crystallizations, in a stoppered glass vessel." *Lond. Edin.*—"Bitartrate of potash, ℔iv.; boiling distilled water, cong. iiss.; prepared chalk, ℥xxv. ℥vi.; dilute sulphuric acid, Ovij. f℥xvij. (Ox. f℥vij, E.); muriatic acid, f℥xxviss. or a sufficiency; boil the bitartrate with cong. ij. of the water, and add gradually half the chalk, when the effervescence is over add the remainder of the chalk first dissolved in muriatic acid diluted with Oiv. of water. After the tartrate of lime has subsided, pour off the liquor, and wash the tartrate frequently with distilled water, till it is tasteless; then pour on it the sulphuric acid, and boil for a quarter of an hour; evaporate (the strained liquor, L.) with a gentle heat, to obtain crystals. Purify by repeated solution, filtration and crystallization."

Physical Properties.—Tartaric acid occurs in white, semitransparent crystals of considerable size, the primary form of which is the right rhombic prism; it is inodorous, but has a purely acid taste. Sp. gr. 1·75.

Chemical Properties.—In the crystalline state it consists of $C^8H^4O^{10}$ with two equivalents of water. The crystals are permanent in the air; exposed to heat, they fuse in their water of crystallization which is all driven off, if the temperature be raised; and at a temperature considerably below redness, the acid is decomposed, and a series of new compounds formed. Tartaric acid is soluble in $1\frac{1}{2}$ parts of cold water, and in half its weight of boiling water; it is also soluble in alcohol. The aqueous solution becomes mouldy by keeping. The most distinguishing characteristic of this acid is the crystalline precipitate, which is produced when it is added in excess to a concentrated solution of a salt of potash.

*Adulterations.*—Tartaric acid is adulterated with bitartrate of potash, and with lime; the former is detected by its little solubility in cold water; the latter by an ash being left, on the acid being incinerated with the aid of red oxide of mercury.

Therapeutical Effects.—To prepare refrigerant drinks in febrile and inflammatory diseases, tartaric acid is much employed as being cheaper than citric acid. Its principal use, however, is for the preparation of effervescing draughts, when added to the alkaline carbonates.

Dose and Mode of Administration.—Gr. x. to ʒss.; its refrigerant effects are best manifested when it is dissolved in a large quantity of cold water. For the preparation of effervescing compounds, the following are the proportions required:—ϑi. of crystallized tartaric acid is saturated by gr. xxvij. of crystallized bicarbonate of potash, or gr. xxxviiiss. of crystallized carbonate of soda, or gr. xxij. of sesquicarbonate of soda, or gr. xvss. of hydrated sesquicarbonate of ammonia.—*Trochisci Acidi Tartarici*, E. (Tartaric acid, ʒij.; pure sugar, ʒviij.; volatile oil of lemons, min. x.; pulverize the sugar and acid, add the oil, mix them thoroughly, and beat them with mucilage into a proper mass for making lozenges). Commonly

employed under the name of *acidulated drops* in mild sore throat, and colds.

INCOMPATIBLES.—The alkalies; salts of potash, of lime, of mercury, and of lead; all carbonates; and the vegetable astringents.

CITRUS AURANTIUM, FRUCTUS SUCCUS, D. AURANTIUM, L.—*The juice of the fruit,* D.—*The fruit,* L.—*of Citrus aurantium.* This tree is indigenous in many parts of Africa and Asia; and is cultivated extensively in the South of Europe, the Azores and the West India Islands. It belongs to the Natural family *Aurantiaceæ,* and to the Linnæan class and order *Polyadelphia Polyandria.*

BOTANICAL CHARACTERS.—Stems, smooth, cylindrical from 12 to 15 feet high; Leaves, oval, pointed, entire, shining, coriaceous, on elongated winged petioles; Flowers, large white, axillary, 2-6 on a common peduncle, fragrant; Fruit, the well known sweet orange.

The fruit of the orange is too well known to require description; the juice consists of citric and malic acids, citrate of lime, mucilage, albumen, sugar and water.

THERAPEUTICAL EFFECTS.—The juice of the sweet orange is an agreeable refrigerant, calculated to allay thirst in febrile and inflammatory affections; it is particularly beneficial in diseases attended with much thirst, and in which it is important, not to introduce a large quantity of fluid into the stomach or intestines, as in strangulated hernia.

LIMONES, D. L. E. LIMONUM SUCCUS, D. L. *Lemons (and Limes,* E.*). Lemon-juice. The fruit of Citrus medica,* D. E.—*of Citrus limonum,* L. E. Natives of the same countries, and belonging to the same botanical classification as *Citrus aurantium.*

BOTANICAL CHARACTERS.—The lemon tree attains a height of 10-15 feet; Leaves, oval, or oblong, usually toothed, petiolate; the petioles simply margined, not winged; Flowers, white, tinged with red; Fruit, ovoid, terminated with an elongated knob; containing an acid pulp.

PROPERTIES.—Lemons are too well known to need description; the juice consists of 1·77 per cent of citric acid, 0·72 of gum, malic acid and bitter extractive, and 97·51 of water. Lemons decay by keeping; Christison states that they are best preserved by packing them with newly-slaked lime in bottles or earthenware jars, the mouths of which are secured with corks and wax. The juice may be kept unchanged for years, by adding to it expressed and strained, a tenth part of spirit of wine, filtering, and preserving in well stopped bottles.

THERAPEUTICAL EFFECTS.—Lemon-juice forms a useful and agreeable refrigerant, allaying thirst and diminishing preternatural heat in febrile and inflammatory diseases; it is also found particularly useful in hemorrhages of an acute character.

Dose and Mode of Administration.—Lemon-juice is usually administered in the form of *lemonade*, which is prepared by adding the juice to about ten or twelve parts of boiling water, and sweetening with sugar to the taste. It is also much employed for the preparation of effervescing draughts with the alkaline carbonates; ℈j. of the bicarbonate of potash requires for its saturation, f℥iiiss. of lemon-juice; ℈i. of the sesquicarbonate of soda, f℥ivss.; and ℈j. of the sesquicarbonate of ammonia, f℥vi.—*Syrupus Limonum*, D. L. E. ("Fresh lemon-juice, *by measure* ℔ij.; as soon as the impurities have subsided, put the juice into a matrass, and subject it to the heat of boiling water for a quarter of an hour, when cold pass it through a sieve; add by degrees, ℥lviij. of white sugar, digest with a medium heat in a covered vessel, frequently shaking it, until it is dissolved; then set it aside for 24 hours, remove the scum, and pour off the syrup from the sediment," D.—"Lemon-juice, strained (freed of impurities by subsidence, and filtering, E.), Oj.; sugar, ℔iiss.; dissolve the sugar in the lemon-juice with a gentle heat, then set it aside for 24 hours; remove the scum, and pour the clear liquor from the dregs," L. E.). An excellent addition to refrigerant drinks; in febrile affections it may be given with barley water. This syrup must be kept in well stopped bottles in a very cool place. Dose, f℥i. to f℥ij.

Mora, L. Morus nigra, baccæ, D. *Mulberries. The fruit of Morus nigra.* A native of Persia, now cultivated in this country; it belongs to the Natural family *Urticaceæ* (*Moraceæ*, Lindley), and to the Linnæan class and order *Monœcia Tetrandria.*

Botanical Characters.—A small tree with rugged bark; Leaves, cordate, lobed; Flowers, greenish, in small roundish catkins; Fruit, dark purple, "consisting of the female flowers, become fleshy and grown together, inclosing a dry membranous pericarp," (Lindley).

Properties.—The fruit, commonly called mulberries, has a faint, agreeable odour, and an acidulous, sweetish taste. It contains, tartaric acid, sugar, colouring matter. and water. It yields its virtues to boiling water.

Therapeutical Effects.—Mulberry juice is an agreeable refrigerant, but taken in quantity it is apt to produce diarrhœa. In the present day it is very seldom used.—The following is the only officinal preparation of mulberries:—*Syrupus Mori*, L. (Juice of mulberries, strained, Oj.; sugar, ℔iiss.; dissolve the sugar in the mulberry juice with a gentle heat, and proceed as for syrup of lemons). Used for the same purposes as the syrup of lemons; it has a fine purple colour. Dose, f℥i. to f℥ij.

Potassæ chloras, L.—*Chlorate of potash.*

Preparation.—An article of the Materia Medica in the London Pharmacopœia, it is prepared on the large scale by transmitting chlorine gas to saturation through a strong solution of carbonate of potash.

Physical Properties.—In flat, pearly crystals, of the oblique prismatic system; inodorous, but having a cooling, unpleasant taste, like that of nitre. Sp. gr. 1·989.

Chemical Properties.—It is composed of one eq. of potassa, and one of chloric acid, (KO, Cl $O^5$). It is permanent in the air; exposed to heat, it fuses and gives out oxygen below a red heat; if the heat be increased, all the oxygen is driven off, and chloride of potassium left. It is soluble in about 12 parts of cold water, and in twice its weight of boiling water. This salt is readily known, by dropping a little sulphuric acid on the crystals, they first become yellow, afterwards red, and give out the greenish-yellow gas,—peroxide of chlorine.

*Adulterations.*—The only impurity met with in this salt is chloride of potassium, and this arises from faulty preparation; it is readily detected by adding nitrate of silver to a solution of the salt in distilled water, if any chloride be present a white precipitate is thrown down.

Therapeutical Effects.—Chlorate of potash in its action on the system, resembles nitre; by some it has been held to be diuretic, but its most manifest action is refrigerant. It was formerly employed in diseases which were supposed to depend on a deficiency of oxygen, as in phthisis, and scurvy. More recently it has been proposed as a remedy in diseases attended with a deficiency of the saline constituents of the blood, as in malignant cholera, typhoid fevers, &c. Almost the only disease, however, in which it is at present used is in *cancrum oris*, or phagedenic ulceration of the cheek in children; and in this affection it proves singularly beneficial.

Dose and Mode of Administration.—Gr. x. to gr. xx. dissolved in water, and sweetened with syrup. The dose for children is from gr. iiss. to gr. v. according to the age, and in the disease above mentioned this quantity should be given every hour or at least every second hour.

Potassæ nitras. *Nitrate of Potash* (described in the division *Diuretics)*, operates as a refrigerant, sensibly diminishing preternatural heat in febrile and inflammatory affections; during its operation also the force and frequency of the pulse are diminished, and consequently it has been named a sedative-refrigerant. The employment of nitre in hemorrhages, particularly hemoptysis, is attended with much benefit, which depends undoubtedly on this combined action. Administered in large doses, it is very generally used on the Continent in the treatment of acute rheumatism, and it is stated with very great success; but its employment in this disease has been hitherto very limited in this country. It proves very beneficial in the treatment of asthma, especially when dependant on disease of the heart. Nitrate of potash is contra-indicated in inflammatory affections of the stomach, the intestinal canal, the kidneys or bladder, in consequence of its irritant properties which have been alluded to in a previous article. Externally, nitre is employed as a means of producing cold during its solution in water.

Dose and Mode of Administration.—In powder, gr. x. to gr. xx.

mixed with sugar or dissolved in water. *Nitre whey,* prepared by boiling ʒij. of nitre in Oj. of new milk and straining, is an excellent refrigerant drink in mild febrile diseases; Dose, fʒij. to fʒiv. Where nitre is to be administered as a refrigerant dissolved in water, the effect is much increased, if the solution is not made until just before it is swallowed.

Rosa canina, fructus, D. Rosa canina, fructus pulpa, L. Rosæ fructus, E. *The fruit,* D.—*The pulp of the fruit,* L.—*The hip, deprived of the carpels,* E.—*of Rosa canina, and of several allied species,* E. The dog-rose is a common indigenous shrub, belonging to the Natural family *Rosaceæ,* and to the Linnæan class and order *Icosandria Polygynia.*

Botanical Characters.—Stem, with scattered, hooked prickles, which are dilated at the base; Leaves, naked or slightly hairy; Leaflets, with irregular serratures; Flowers, rose red; Fruit, scarlet.

Properties.—The pulp *(hip)* of the dog rose consists of the fleshy calyx, inclosing numerous small carpels enveloped with hairs; it is of a bright scarlet colour, smooth and shining. The external coat alone is used in medicine; it should be carefully freed from the carpels and hairs; it has a sweetish acidulous taste, and is composed chiefly of uncrystallizable sugar, gum, citric and malic acids.

Therapeutical Effects.—The hip of the dog-rose is an agreeable refrigerant; it is only employed in medicine in the following preparation.—*Confectio Rosæ caninæ,* E. *Conserva Rosæ fructus,* L. ("Pulp of the dog-rose, ℔j.; sugar, powdered, ʒxx.; Expose the pulp of the rose to a gentle heat in an earthen vessel, then add the sugar gradually, and rub together until they are thoroughly incorporated," L.—"Take any convenient quantity of hips carefully deprived of their carpels, beat them to a fine pulp, adding gradually thrice as much sugar," E.). Used only as a basis for forming more active remedies into pills or electuaries, and as it contains no tannin, it may be employed for this purpose with the salts of iron.

Rumex, L. Rumex acetosa, folia, D. *Sorrell. The leaves of Rumex acetosa.* An indigenous plant, belonging to the Natural family *Polygonaceæ,* and to the Linnæan class and order *Hexandria Trigynia.*

Botanical Characters.—1-2 feet high; Leaves, oblong, arrow shaped; Flowers purplish, with large, orbiculari-cordate petals; Nuts, triquetrous.

Properties.—Sorrel leaves have an agreeable acidulous taste, which they owe to binoxalate of potash, they also contain tartaric acid.

Therapeutical Effects.—They were at one time employed for preparing acidulous refrigerant drinks in fevers, but are now never used.

RUMEX AQUATICUS, RADIX, D. The root of the *Great water dock* is still retained in the Dublin Pharmacopœia, but its use is quite obsolete. It was formerly employed for preparing alterative diet drinks in secondary syphilis.

SAMBUCUS NIGRA, BACCÆ, D. The berries of the elder (described in the division *Cathartics*), contain a purple juice which is refrigerant, and by some, said to be mildly laxative. The following preparation, in the present day scarcely ever employed, was formerly used diluted with water, to prepare a cooling drink in febrile and inflammatory affections.—*Succus spissatus Sambuci*, D. (Bruise fresh, ripe elder-berries in a mortar, express the juice and evaporate it unstrained, with the aid of a vapour-bath, to a proper consistence, stirring constantly with a spatula towards the end of the evaporation).

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# CHAPTER XVII.

## SEDATIVES OR CONTRA-STIMULANTS.

### (Calmatives).

SEDATIVES are medicines which directly or primarily depress the vital powers, without inducing any previous excitement; from their action being the reverse of stimulants, they have been also very generally termed CONTRA-STIMULANTS. This class of medicinal agents has been in general confounded with *Narcotics*; and were we merely to theorize on their mode of action, it would be perhaps difficult to draw an exact line of distinction, but when we come to consider the remedial powers of the medicines classed under each head, it will, I think, be at once evident, how *practically* essential it is, that we should recognize this as an especial class of remedial agents. The diseases in which sedatives are employed are those of over excitement of the nervous and vascular systems; some of the substances contained in this class, for example Hemlock, act directly on the nervous system; while others, as Digitalis, influence more immediately the vascular organs. It will be, therefore, necessary before prescribing for individual cases, to consider attentively the peculiar operation of the different sedatives. An important and practical rule to be borne in mind, with reference to the opera-

tion of contra-stimulants, is that the dose must be in general proportioned to the degree of excitement present; this *tolerance* of medicines is remarkably illustrated by the very large doses of *tartar emetic* which are administered not only with impunity, but with advantage, when inflammatory action runs high.

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Acidum hydrocyanicum, E. Acidum hydrocyanicum dilutum, L. Acidum prussicum, D. *Medicinal Hydrocyanic or Prussic acid. Hydrocyanic acid diluted with about fifty (thirty,* E.) *parts of water.*

Preparation.—*Dub.*—"Cyanuret of mercury, ℥i.; muriatic acid, f℥vij.; water, f℥viij.; from a glass retort distil into a refrigerated receiver, f℥viij; preserve in a well closed bottle in a cool dark place. The specific gravity of this acid is to that of distilled water, as 998 to 1000." *Lond.*—"Ferrocyanide of potassium, ℥ij.; sulphuric acid, ℥iss.; distilled water, Oiss.; mix the acid with f℥iv. of the water, and to these when cooled and put into a glass retort, add the ferrocyanide of potassium first dissolved in Oss. of water; pour f℥viij. of the water into a cooled receiver, then the retort being fitted on, let f℥vj. of acid pass into this water distilled with a gentle heat in a sand bath. Lastly, add f℥vi. more of distilled water, or as much as may be sufficient, that 12·7 grains of nitrate of silver dissolved in distilled water may be accurately saturated by 100 grains of this acid. Diluted hydrocyanic acid may be also prepared, when it is more immediately wanted, from gr. xlviiiss. of cyanide of silver, added to f℥i. of distilled water, mixed with gr. xxxixss. of hydrochloric acid. Shake all these in a well-stopped vial, and after a short interval pour off the clear liquor into another vessel. Keep this for use, the access of light being prevented." *Edin.*—"Ferrocyanide of potassium, ℥iij.; sulphuric acid, f℥ij.; water, f℥xvj.; dissolve the salt in f℥xj. of the water, and put the solution into a matrass with a little sand; add the acid previously diluted with f℥v. of the water and cooled; connect the matrass with a refrigeratory; distil with a gentle heat, by means of a sand bath or naked gas-flame till f℥xiv. pass over, or till the residuum begins to froth up; dilute the product with distilled water till it measures f℥xvj."

Physical Properties.—Medicinal hydrocyanic acid is a colourless liquid with a peculiar penetrating odour, and a bitter taste, leaving a warm sensation on the tongue and palate. The odour is generally stated to resemble that of the volatile oil or distilled water of bitter almonds, but it is decidedly different and should not be confounded with it. The specific gravity varies with the quantity of real or anhydrous acid contained in it.

Chemical Properties.—The medicinal acid is a mixture of anhydrous hydrocyanic acid and water. Prepared according to the directions of the Dublin College it contains, according to Barker's observations, 1·6 per cent of real acid; but according to Mr. Donovan, 2·82 per cent. The London preparation contains 2 per cent, and the Edinburgh 3·3 per cent. Anhydrous hydrocyanic acid is composed of 1 eq. of cyanogen, and 1 of hydrogen, (H+Cy.). The quantity of pure acid

contained in the medicinal preparation, may be readily ascertained, "by accurately weighing a portion of it, amounting to about 100 grains, adding to this portion nitrate of silver in excess, collecting the white insoluble precipitate of cyanide of silver which falls on a weighed filter, drying and weighing together precipitate and filter; five parts of the precipitate correspond to one part of pure acid," (Graham). Hydrocyanic acid reddens litmus paper feebly and the red tint disappears by heat; it is very volatile, and soon decomposes by keeping, a black precipitate being formed in it. For medicinal purposes, the dilute acid may be kept for a long time unchanged by the addition of a few drops of sulphuric acid. The best test for the presence of this acid is its action on sulphate of iron; if a few drops of a solution of caustic potash be added to a fluid suspected to contain hydrocyanic acid, and then a solution of some proto- and sesqui-salt of iron, as the common sulphate or tincture of the muriate of the shops, a greenish precipitate is produced which becomes bright Prussian blue on the addition of a little sulphuric acid. Its presence is also indicated by adding a few drops of sulphuric acid to the liquid containing it, and covering the vessel with a glass plate having its lower surface moistened with a solution of nitrate of silver; owing to the volatility of the acid the surface of the plate will be covered with the white cyanide of silver.

*Adulterations.*—Medicinal prussic acid, as met with in the shops, varies much in strength, is often much contaminated with impurities, and frequently is unfit for use from having been too long kept. The strength is most conveniently ascertained by Professor Graham's test given above, of course bearing in mind the difference of the preparations of the three British pharmacopœias. The presence of any fixed impurity is indicated by the preparation not being entirely vaporizable by heat. The most common impurity met with is sulphuric or muriatic acid; the presence of either may be suspected if the medicinal preparation acts strongly on litmus paper; they may be easily detected by the test first proposed by my friend Professor Geoghegan. "Drop one or two crystals of the *hydrargyro-iodo-cyanide of potassium** into the suspected acid, should any foreign acid be present a red precipitate will immediately be formed on them." Concentrated distilled water of bitter almonds is sometimes substituted for prussic acid; it may be detected by placing a small quantity of the suspected liquid in an open phial in a sand-bath, and holding a piece of litmus paper over the mouth of the bottle, if it be bitter almond water no effect will be produced on the paper, but it will be reddened by the vapour of prussic acid. When unfit for use from being kept too long, prussic acid is generally, though not always discoloured.

Therapeutical Effects.—Hydrocyanic acid is the most powerful poison with which we are acquainted; "death has been occasioned in man by a mixture containing scarcely one grain of the anhydrous acid," (Christison). The usual symptoms produced by a poisonous dose, are convulsions, difficult and spasmodic breathing, and insensibility, followed

* This salt may be readily prepared by adding a concentrated solution of bycyanide of mercury to a solution of iodide of potassium, when it is precipitated in the form of white or pearly crystalline plates.

by death in a few minutes; in some instances, however, life has been prolonged for half an hour or more; but if the quantity taken be very large, death occurs so rapidly that the only symptoms that can be observed are two or three deep hurried inspirations, generally preceded by a loud shriek. In medicinal doses, hydrocyanic acid acts as a direct sedative, producing immediately after it has been taken a sensation of quiet and calmness throughout the whole system, diminishing the force and frequency of the pulse, lowering the sensibility of the nervous system, and allaying irritation when it exists; in addition to the above, which may be said to be its more immediate effects, hydrocyanic acid promotes the digestive powers, and in many instances acts gently on the bowels. As a remedial agent this acid has been principally used to allay irritability, to diminish pain, and to lessen spasm. Thus, it has been used with much benefit in spasmodic and painful affections of the stomach and bowels, as in *gastrodynia* and *enterodynia*, in *pyrosis*, particularly when accompanied by much pain; in chronic vomiting, and in *colica pictonum*. It has been also found very serviceable in allaying irritable or spasmodic cough in various pulmonary affections, as in simple hooping cough unaccompanied with inflammation, in pure spasmodic asthma, in the advanced stages of phthisis, and in the spasmodic cough of nervous and hysterical females. It has been successfully employed to allay vomiting and purging in severe cases of common cholera, and to check the colliquative diarrhœa and sweating of hectic. Lastly, it has been administered as a calmative and anodyne in neuralgia, tic douloureux, chronic rheumatism, cancerous affections, and nervous palpitations, but its success has been very equivocal. Externally, in the form of lotion, it will be found very serviceable in allaying the violent itching which attends many forms of skin disease.

Dose and Mode of Administration.—The medicinal acid should be at first administered in doses of one or two drops, which should be repeated every second or third hour according to circumstances, its effects being very transitory. It is best given in distilled water to which simple syrup may be added; it should be always prescribed in the form of draught, as when given in mixture, it is apt to float on the top of the liquid, and thus a single dose may produce dangerous effects. The quantity given should be increased very gradually, and its effects carefully watched. For external use, a lotion may be prepared with f℥ij. of the acid, and f℥viij. of distilled water.

Incompatibles.—Nitrate of silver; red oxide of mercury; sulphate of copper; sulphate and muriate of iron if an alkali be present; all sulphurets; and strychnia.

In cases of poisoning with prussic acid, if the person be seen immediately, he should be made to inhale ammonia or chlorine diluted with atmospheric air, or the solution of either of these gasses in water should be administered in small but frequently repeated doses; but if some time has elapsed, and insensibility be present, the most powerful external stimulants, with the cold affusion, and artificial respiration, should be employed. More recently the Messrs. Smith of Edinburgh have proposed a mixture of a proto- and a per-salt of iron combined with an alkaline carbonate, as an antidote for prussic acid; and from the experiments

performed with it, its use appears to be attended with complete success. The method recommended by these gentlemen is as follows:—Dissolve gr. x. of sulphate of protoxide of iron in f℥i. of water and add to it f℥i. of tincture of muriate of iron; and dissolve in another vessel gr. xx. of carbonate of potash in f℥i. or f℥ij. of water; the latter solution is to be administered first, and immediately afterwards the solution of iron.

ACONITUM, E. ACONITI FOLIA ET RADIX, L. ACONITUM PANICULATUM, FOLIA, D.—*Monkshood. The leaves (and root, L.) of Aconitum paniculatum*, D. L.—*The leaves of Aconitum napellus*, E. It has not been yet accurately ascertained which species of the genus *Aconitum* was employed by Störck, who was the first to use it as a medicine; the reference of the Edinburgh College is not only the more correct, but, according to the accurate experiments of Dr. Alexander Fleming, the species of aconite there indicated is the only European species possessed of any medicinal activity. It is said to grow wild in some parts of England, but it was probably introduced from the Continent of Europe, where it grows abundantly in woods. It belongs to the Natural family *Ranunculaceæ*, and to the Linnæan class and order *Polyandria Trigynia*.

BOTANICAL CHARACTERS.—Root, tapering, with one or more pyriform tubers attached; Stems, simple 2-6 feet high; Leaves, palmate, cuneate, pinnatisect; Flowers on a cylindrical simple raceme, deep hairy, with an irregular petaloid calyx, the upper leaflet of which is helmet shaped.

MODE OF PREPARATION.—The root should be dug up immediately after the plant flowers, and the tubers alone employed, they should be cut into thin slices, and dried slowly at a low temperature; the leaves should be gathered just before the flowers expand, and dried carefully with a stove heat.

PHYSICAL PROPERTIES.—Aconite root has a faint earthy odour, and a bitter acrid taste, leaving a benumbing impression on the lips and tongue. The leaves have a very feeble narcotic odour; their taste is similar to that of the root. When carefully dried, they retain their virtues for many years, if kept in close vessels in a dry place excluded from the light.

CHEMICAL PROPERTIES.—No very accurate chemical analysis has been made of this plant. It contains an acrid volatile principle, green colouring matter, vegetable albumen, some salts, and a peculiar alkaloid, first discovered by Brandes and named by him *aconitina;* as this substance has been introduced into the last edition of the London Pharmacopœia, the process for preparing it and its properties will be described amongst the pharmaceutical preparations of the plant. Aconite leaves or root yield their active principles completely to alcohol, but very imperfectly to water.

THERAPEUTICAL EFFECTS.—In large doses the leaves or root of aconite are highly poisonous, appearing to produce death by a direct depression of the vital powers: thus, the most manifest symptoms are slight wandering delirium, the consciousness being partly retained, general muscular tremors or very slight convulsions, and failure of the circu-

lation; in addition to which a feeling of numbness and tingling is experienced over the entire of the body; a diminution of the temperature of the surface takes place, and there is frequently loss of sight, the pupil of the eye which was at first contracted becoming dilated; and death by *syncope* takes place. As a medicine it has been used with the most marked benefit in all forms of painful diseases even when accompanied by inflammation; this is well illustrated by its employment in the treatment of acute rheumatism, and of neuralgia. In the former of these diseases it has proved in the hands of Dr. Lombard of Geneva, a complete specific, and his statements have been fully borne out by the experience of Dr. Fleming; the alcoholic extract given in doses of from half a grain to eight grains frequently repeated, curing the severest attacks of febrile rheumatism in from two to six days, and affording marked relief within an hour or two after the first dose is taken. It has not, however, proved so successful in the practice of other British physicians, which is probably owing to the inertness of the officinal extract of the Dublin and London Pharmacopœias; in a few cases in which I employed the powdered leaves, the beneficial results were most marked. In neuralgic pains, particularly *tic douloureux*, applied externally in the form of tincture, it seldom fails to ameliorate the suffering, and in many instances will cure the disease. It is not so useful in *sciatica* or *lumbago*. It has been also employed in the treatment of many other diseases, but in none of them has its efficacy been well established. Aconitina has been used in the same cases as the preparations of the leaves or root of aconite, but owing to its high price and its intensely poisonous properties, it has been hitherto but little employed.

Dose and Mode of Administration.—The powder of the root or leaves may be given in doses of from gr. iij. to gr. xij. gradually increased until some effects are produced.—*Extractum Aconiti*, L. E.—*Succus spissatus Aconiti*, D. ("Fresh aconite leaves, ℔j., bruise them sprinkled with a little water in a stone mortar, then press out the juice and evaporate it unstrained to a proper consistence," D. L.—"Take of fresh leaves of monkshood any convenient quantity, beat them into a pulp, express the juice, subject the residue to percolation with rectified spirit, so long as the spirit passes materially coloured; unite the expressed juice and the spirituous infusion; filter, distil off the spirit, evaporate the residue in the vapour bath taking care to remove the vessel from the heat so soon as the due degree of consistence shall be attained," E.). As aconite leaves yield their active principles almost entirely to alcohol, and but very partially to water, the Edinburgh preparation only can be active. The dose of it is gr. ij. to gr. viij. repeatedly.—*Tinctura Aconiti*, Fleming, (Take of the tubers of Aconitum napellus, carefully dried and finely powdered, ℥xvi. (Troy); rectified spirit, f℥xvj.; macerate for four days, then pack into a percolator; add rectified spirit until f℥xxiv. of tincture are obtained.) This tincture is beautifully transparent, of the colour of sherry wine, and has a slightly bitter taste. Dose, min. v. three times a day, increased by one minim daily, until its effects are produced; it should be used with caution; it is the best form for external use, when aconitina cannot be procured.—*Extractum Alcoholicum Aconiti*, Fleming, (Prepared by distilling off the spirit from the

tincture, at a low temperature, until the consistence of an extract is obtained. The process should be completed in a vapour bath). Its colour is dark brown or almost black; it has an agreeable smell, and a bitter taste. Dose, one-third of a grain thrice daily, commencing with one-sixth of a grain.—*Unguentum Aconiti,* (The alcoholic extract, 1 part; prepared lard, 2 parts; mix). An excellent application rubbed over the painful part in neuralgia.—*Aconitina,* L., (Aconite root, dried and bruised, ℔ij.; rectified spirit, cong. iij.; dilute sulphuric acid; solution of ammonia; purified animal charcoal, of each, a sufficiency. Boil the aconite with a gallon of the spirit for an hour in a retort with the receiver adapted to it, pour off the liquor, and again boil the residue with another gallon of spirit and with the spirit recently distilled, and pour off the liquor; let the same be done a third time. Then press the aconite, and all the liquors being mixed and strained, let the spirit distil; evaporate what remains to the proper consistence of an extract. Dissolve this in water and strain; evaporate the liquor with a gentle heat that it may thicken like a syrup. To this add of dilute sulphuric acid mixed with water, as much as may be sufficient to dissolve the aconitina; then drop in the solution of ammonia, and dissolve the precipitated aconitina in dilute sulphuric acid and water mixed as before; afterwards mix the animal charcoal, frequently shaking them during a quarter of an hour. Lastly, strain, and solution of ammonia being again dropped in, that the aconitina may be precipitated, wash and dry it). Aconitina is in the form of a white semi-crystalline powder, odourless, with a bitter taste. It is very soluble in sulphuric ether, less so in alcohol, and very slightly in water. When perfectly pure, this alkaloid is so powerful a poison "that a fiftieth of a grain has endangered the life of an individual," (Pereira). As usually met with it is of a grayish yellow colour, in which state it is very impure. Aconitina possesses, but of course much more powerfully, the same medicinal virtues as monkshood; it has been principally used in the form of ointment in *tic douloureux,* and other neuralgic pains. But it does not appear to possess sufficient advantages over the alcoholic extract, as (considering its enormous price, 3*s.* 6*d.* to 4*s.* 6*d.* a grain) would warrant its employment as a medicinal agent. It cannot be administered internally with safety.—*Solutio Aconitinæ,* Turnbull, (Aconitina, gr. viij.; rectified spirit, f℥ij.; dissolve). Applied externally by means of a small sponge.—*Unguentum Aconitinæ,* Fleming, (Aconitina, gr. xvj.; rectified spirit, min. xvi.; rub well together, and add of axunge ℥i.; mix). Employed by friction with the finger during several minutes. If there be any abrasion of the cuticle the external application of aconitina can not be unattended with danger.

In cases of poisoning with monkshood, emetics should be immediately administered, and the most active stimulants both external and internal should be employed. Tannin has been recommended as an antidote in consequence of its forming insoluble compounds with the vegetable alkaloids; but most of the insoluble tannates are digestible in the human stomach.

AMYGDALÆ AMARÆ OLEUM. *Essence (Volatile oil) of bitter-almonds.* The bitter-almond tree has been described in the division *Emollients.*

PREPARATION.—Oil of bitter-almonds is obtained by submitting bitter-almond cake, left after the separation of the fixed oil by expression, to distillation with water.

PHYSICAL PROPERTIES.—As usually met with it is of a golden-yellow colour, but when obtained from almonds which have been blanched it is colourless when first drawn. It is transparent, with an agreeable *ratifia* odour, and an acrid, warm, bitter taste. It is heavier than water, its specific gravity being 1·083.

CHEMICAL PROPERTIES.—Oil of bitter-almonds, as prepared by distillation, consists of from 8·5 to 14·33 per cent of pure hydrocyanic acid, mixed with *benzoïc acid, benzoïn, benzimide,* and *hydruret of benzoil.* Its poisonous and medicinal properties depend on the hydrocyanic acid, which may be completely removed from it by repeated distillation from a solution of caustic potash. The oil is very soluble in alcohol and ether; by agitation with water, a portion of the hydrocyanic acid is dissolved out, and the water acquires the peculiar odour and taste of the acid.

THERAPEUTICAL EFFECTS.—As the medicinal properties of this oil depend on the hydrocyanic acid it contains, its effects and uses are of course similar to those of that acid, for which it has been proposed as a substitute; but as its strength is very variable, it is scarcely adapted for internal use. It should be borne in mind that the oil of bitter-almonds is at least four times the strength of officinal prussic acid.

DOSE AND MODE OF ADMINISTRATION.—Min. ij. may be dissolved in f℥ss. of rectified spirit, and of this solution min. iij. to min. vj. may be given occasionally.—*Vegetable Hydrocyanic Acid,* SCHREDER, (Oil of bitter almonds, min. iv.; rectified spirit; and distilled water, of each, min. xxx.; dissolve). Dose, min. ij. to min. iij. every second or third hour.

AMYGDALUS PERSICA, FOLIA, D. *Peach-leaves. Leaves of Amygdalus Persica (Persica vulgaris,* MILLER). The peach tree, originally a native of Persia, is now cultivated extensively in our gardens; it belongs to the Natural family *Rosaceæ (Drupaceæ,* Lindley), and to the Linnæan class and order *Icosandria Monogynia.*

BOTANICAL CHARACTERS.—A small tree, with lanceolate, serrate or crenate leaves, and rose-coloured flowers; Fruit, a fleshy, tomentose drupe.

PROPERTIES.—*Peach-leaves* when bruised emit the peculiar bitter-almond odour; by distillation with water they yield a small quantity of volatile oil, which contains hydrocyanic acid. Their active principles are extracted by boiling water.

THERAPEUTICAL EFFECTS.—The medicinal properties of peach-leaves are precisely similar to those of the cherry laurel, but much weaker.

They are consequently scarcely ever used, and might be well spared from the Materia Medica. Both leaves and flowers were formerly employed in the form of infusion, as anthelmintics for children, but several fatal accidents having occurred from their incautious administration, their use as such was very properly abandoned.

Antimonium tartarizatum. *Tartar emetic* (described in the division *Diaphoretics*), when administered in full doses frequently repeated, acts on the human system as a direct *sedative* or *contra-stimulant*, this effect being most manifest, when it is given in inflammatory diseases. Under the influence of doses of one, two, or three grains repeated every hour, or every second hour, the nausea, vomiting, or purging which are produced by the first or second dose cease entirely, the force and frequency of the heart's action is lowered, and local inflammation is arrested. In Lepelletier's essay, two cases of pneumonia are mentioned, in one of which the pulse was reduced from 120 to 34 beats per minute in nine days, and in the other from 72 to 44 beats per minute in three days, under the use of continued doses of tartar emetic. This contra-stimulant power of tartar emetic is applied with benefit to the treatment of acute inflammations, in which it is administered either alone or as an adjunct to bleeding or other antiphlogistic means. The diseases in which this plan of treatment has been found most beneficial are *acute pneumonia* and *pleuritis*. British practitioners usually employ either local or general bleeding in these diseases, in conjunction with tartar emetic; but, although in pleuritis the combined abstraction of blood will be in most instances absolutely requisite, many cases of pneumonia will be cured as speedily and as effectually by the use of tartar emetic alone, indeed by many physicians bleeding is considered singularly injurious to the development of the sedative influence of this medicine. This mode of administering tartar emetic has been also employed in the treatment of bronchitis, of arachnitis, and of many other acute inflammations, but in none are its beneficial effects so manifest as in inflammation of the lungs, and in pleurisy. As a contra-stimulant, tartar emetic is given in doses of from half a grain to two grains every hour or every second hour, dissolved in a small quantity of water—one or two ounces at most; the best vehicle for its administration is orange-flower water. The first dose or two should not exceed half a grain, and the patient should not be permitted to drink, so as if possible to avoid producing vomiting; when once a tolerance of the medicine is produced in the system, the quantity taken may be rapidly increased.

Carbonis chloridum. *Chloride of Carbon; Chloride of Formyle; Chloric ether; Terchloride of Carbon.*

Preparation.—The exact process employed for the preparation of the liquid used in medicine under the above names, has not been made public. It may, however, be easily obtained by mixing together three or four parts of alcohol, (Sp. gr. 0·844,) and one of chloride of lime, putting them into a clean copper still and distilling as long as the product that comes over is sweet and aromatic.

Properties.—It is an ethereal, oily-looking liquid, with a sweetish cooling taste, and an ethereal odour bearing some resemblance to that of chlorine. According to the analysis of Dumas it is composed of 2 eq. of carbon, 1 of hydrogen, and 3 of chlorine, its formula being $C^2H\,Cl^3$. It has been named by Liebig *chloride* or *perchloride of formule*. It is heavier than water, its sp. gr. being 1·480; it boils at 142° F. It is soluble in alcohol and ether, but is insoluble in water, with which, however, it is miscible in almost every proportion.

Therapeutical Effects.—This preparation has been hitherto but little employed in this country; it has been, however, used extensively both in America and on the Continent. Its operation is that of a decided sedative whether it be administered internally or employed as a local application. It has been used with advantage in asthma, spasmodic cough, and in cancerous and other painful diseases. In the treatment of cancer it has been extensively employed by Mr. Tuson of the Middlesex Hospital, London, and it is spoken of by him in the most extravagant terms both as a local application to open cancer of the breast, and as an internal remedy to relieve pain and procure sleep.

Dose and Mode of Administration.—Internally, min. iij. to min. v. suspended in water; but so large a dose as f3i. has been administered without producing any injurious effects. For external use f3i. to f3ij. may be mixed with Oj. of water for either a lotion or injection.

## Conium, E. Conii folia et fructus, L. Conium maculatum, folia, D. *Hemlock. The leaves (and fruit,* L.*) of Conium maculatum.*

Indigenous; belonging to the Natural family *Umbelliferæ (Apiaceæ,* Lindley,) and to the Linnæan class and order *Pentandria Digynia.*

Botanical Characters.—Biennial; Root, fusiform, whitish, 6-12 inches long; Stem 2-6 feet high, striated and spotted with purple, smooth, glaucous, hollow, much branched upwards; Leaves, large, tripinnate; leaflets, lanceolate, pinnatifid with acute and often cut segments; Flowers, white, in umbels of many general as well as partial rays; *General involucre* usually 3-7 leaflets; *Partial involucre* of 3 leaflets on one side; Fruit, ovate, compressed laterally, with five primary undulato-crenate ridges. The whole plant when bruised, emits a peculiar fetid odour like that of mice.

Preparation.—The leaves are officinal in the three British pharmacopœias, they should be gathered when the plant is in full flower, the stalks carefully picked out, and the leafy part dried with a stove heat excluded from the light. For medicinal purposes they should be kept in well-stopped opaque bottles or jars, but as they lose much of their virtues by keeping, the druggist's stock should be renewed every year. The seeds are collected when fully ripe, they are more active than the leaves and preserve their medicinal powers for a much longer period.

Physical Properties.—Hemlock leaves in the fresh state are of a glaucous-green colour, and possess remarkably the characteristic odour of the plant; by drying they acquire a dull greyish-green colour, and lose much of their odour. They have a nauseous bitter taste. The fruit has a weaker odour, its taste is bitter, and somewhat acrid.

Chemical Properties.—Hemlock leaves and fruit contain, a peculiar alkaloid which has been named *conia (coneïn*, or *conicin)*, a volatile odorous principle, albumen, resin, colouring matter, and some salts. The active principle of the plant is the alkaloid *conia;* it is a colourless oily liquid, lighter than water, with a peculiar, penetrating, very disagreeable odour, and an intensely acrid taste; it is nearly as active a poison as pure prussic acid. *Conia* is obtained by the distillation of the leaves or fruit with a caustic alkali; it exists in the greatest quantity in the full grown green fruit, eight pounds yielding half an ounce of *hydrated conia* (Christison). The composition of this alkaloid is $C^{12}$ $H^{14}$ N O. On triturating the leaves or fruit of hemlock with caustic potash, the peculiar odour of *conia*, which should not be confounded with that of the plant, is emitted; and as the medicinal virtues depend on the presence of this alkaloid, a ready test is thus afforded of ascertaining the goodness of any of the preparations of hemlock. The leaves and fruit yield their active properties to water, alcohol, oils, and fats.

*Adulterations.*—Other umbelliferous plants which bear a general resemblance to hemlock are frequently confounded with it, and their leaves often sold for those of the true plant. The distinguishing botanical characteristics of the plant are, its smooth purple-spotted stem, and its unilateral partial involucre; the fruit is readily known by its undulato-crenate primary ridges. Chemically, all parts of the plant are known by the peculiar odour of conia evolved on trituration with caustic potash; and this test, as before remarked, is also applicable for ascertaining the quality of the officinal preparations of hemlock.

Therapeutical Effects.—From the investigations which have been recently made as to the action of hemlock, particularly those of Professor Christison and Mr. Judd, it would appear that its influence is chiefly exerted on the nerves of motion, and that its medicinal powers are those of a direct sedative. When taken in poisonous doses, the symptoms preceding death are very similar to those produced by asphyxia from any cause; thus "it does not excite convulsive spasms, or bring on insensibility—but it exhausts the nervous energy of the spinal chord and voluntary muscles, occasioning merely convulsive tremors and slight twitches, and eventually general paralysis of the muscles, and consequent stoppage of the breathing" (Christison.) Much difference of opinion exists as to the action of hemlock when employed as a medicine, and consequently as to the diseases in which it proves beneficial; this arises from the fact, that the preparations of hemlock which were in general use until very lately were perfectly inert; for since the discovery of the active principle of the plant, it has been satisfactorily shewn, that the application of even a moderate degree of heat, when continued for any time, causes it to undergo decomposition, and therefore that the extract (the preparation most generally employed), when prepared according to the directions of the Dublin and London Pharmacopœias is deprived almost completely of its medicinal virtues; and of this I have frequently satisfied myself by the potash test. In the present day, but little faith is placed in the virtues of hemlock as a deobstruent and alterative in the treatment of glandular or visceral enlargements, of scrofulous affections,

of secondary syphilis, or of chronic skin diseases, for which it was at one time highly esteemed. I have derived very beneficial results from the use of hemlock in many painful affections, some of which were attended with inflammation; the preparation which I employed was the expressed juice carefully prepared from the fresh leaves gathered when the plant was in full flower. The diseases in which I principally used it were the various rheumatic affections,—both acute and chronic, neuralgia, senile gangrene, and cancerous diseases of various parts of the body; in all of which I have found it alleviate pain and diminish nervous excitement. On the whole from the experience which I have had of it, I am inclined to think that hemlock will be found an anodyne and sedative of much power, an opinion which from numerous communications that I have recently received is confirmed by the experience of others, who have employed it in consequence of my publications on its medicinal properties in the 26th and 28th volumes of the Dublin Journal of Medical Science. Hemlock has been employed externally in the form of cataplasm or ointment to cancerous and painful ulcerations, and to tender glandular enlargements. In several cases in which the use of the expressed juice of hemlock had been persevered in for some time, and the dose much increased, the patients complained of great dryness with a painful feeling of constriction of the pharynx, which, however, soon disappeared on the suspension of its use and the administration of an active cathartic. In a few instances, also, slight head-ache was experienced. These are the only physiological effects which I have seen produced by hemlock, although I have employed it very extensively for some years back; and in no instance have I seen any injurious consequences follow its employment.

Dose and Mode of Administration.—The dose of the powder of the leaves, a bad form, is from gr. v. to gr. x. three or four times a day; of the powder of the seeds gr. iij. to gr. vi. may be given; the quantity should be gradually increased.—*Extractum Conii*, L. E. *Succus spissatus Conii*, D. ("Fresh hemlock leaves, ℔j.; bruise them, sprinkled with a little water, in a stone mortar; then press out the juice, and evaporate it unstrained, to a proper consistence," D. L.—"Take of conium, any convenient quantity; beat it into a uniform pulp in a marble mortar, express the juice and filter it. Let this juice be evaporated to the consistence of firm extract, either in a vacuum with the aid of heat, or spontaneously in shallow vessels exposed to a strong current of air, freed of dust by gauze or screens.—This extract is of good quality only when a very strong odour of conia is disengaged by degrees on its being carefully triturated with Aqua potassæ," E.). Dose, gr. iij. to gr. v. gradually increased. This is always an uncertain preparation, and does not keep well.—*Tinctura Conii*, D. L. E. ("Hemlock leaves, dried, ℥ij. (℥v., L.); cardamom, bruised, ℥i.; proof spirit, *by measure* ℔j. (Oij., L.); macerate for 7 (14, L.) days, and strain," D. L.—"Fresh conium leaves, ℥xij.; tincture of cardamom, Oss.; rectified spirit, Oiss.; bruise the leaves, express the juice strongly; bruise the residuum, pack it firmly in a percolator; transmit first the tincture of cardamom, and then the rectified spirit, allowing the spirituous liquors to mix with the expressed juice as they pass through:

add gently water enough to the percolator for pushing through the spirit left in the residuum. Filter the liquor after agitation," E.). The tincture of the Edinburgh College is a much superior preparation to that of either Dublin or London as being prepared from the fresh leaves, nevertheless as the process requires some nicety of manipulation, it is apt to vary in strength, which the presence of the tincture of cardamoms will prevent us from judging of; the dose of it is from min. xx. to min xl. gradually increased.—*Succus Conii,* (Fresh hemlock leaves, any quantity; express the juice strongly; set aside for 48 hours, pour off the clear supernatant liquor, and add to it a fifth part of rectified spirit). This is the most certain of the preparations of hemlock, as it is of a uniform strength, and keeps well. Dose, min. xxx. gradually increased to f℥i. every third or fourth hour, its effects being carefully watched. It is best administered in camphor mixture or in distilled water sweetened with simple syrup, or syrup of red poppies.—*Pilulæ Conii compositæ,* L. (Extract of hemlock, ℥v.; ipecacuanha, powdered, ℥i.; mixture of acacia, as much as may be sufficient; beat them together until they are incorporated). Dose, gr. v. three times a day; intended for an anodyne and expectorant in hooping cough, bronchitis, and the incipient stage of phthisis, but, from the observations made above on the extract, its powers must be very feeble.—*Cataplasma Conii,* D. L. ("Hemlock leaves, dried, ℥j.; water, *by measure* ℔iss.; boil down to ℔j., and to the strained liquor, add as much of the same kind of powder, as is sufficient to make a cataplasm," D.—"Extract of hemlock, ℥ij.; water, Oi.; mix, and add linseed, bruised, as much as may be sufficient to make it of a proper consistence," L.). A soothing poultice to painful ulcers or glandular enlargements. The fresh leaves, bruised, would form a much better application.—*Unguentum Conii,* D. (Fresh hemlock leaves; and prepared hog's-lard, of each, ℔j.; boil the leaves in the lard until they become crisp, then express through linen). An excellent sedative and anodyne ointment.—*Emplastrum Conii,* (Yellow wax, 2 parts; resin, and olive oil, of each, 1 part; soap plaster, a sixth part; melt together, and add to the mass when it begins to cool, powdered hemlock, 2 parts; mix thoroughly). For neuralgic and rheumatic pains; in cancer of the stomach, liver, or uterus, over the site of these organs; and in glandular enlargements in the abdomen.

Incompatibles.—The caustic alkalies; the vegetable acids; and vegetable astringents.

In cases of poisoning with hemlock, the same treatment should be followed as in poisoning with monkshood, (see page 255).

Creasotum. *Creasote* (described in the division *Astringents*), when given in poisonous doses, appears from the observations of Dr. Rose Cormack, to resemble prussic acid in its sudden depressing action on the heart, as well as in the temporary nature of its toxicological operation. In medicinal doses, independent of its astringent property already described (see page 43), it operates as a sedative and calmative;

it has been principally used in nausea and vomiting, in checking which it proves highly beneficial. It is particularly useful in the morning sickness of pregnancy, and in cases of hysteric vomiting. Creasote will be also found very efficacious in allaying vomiting when it arises from nervous irritability, or functional disorder of the stomach; but it generally fails when organic disease is present, or where the vomiting is symptomatic of diseases of other organs. In the obstinate vomiting of sea-sickness, this remedy has been found by some to prove useful, and in all the nostrums of the present day for preventing sea-sickness creasote is a principal ingredient. In *neuralgia* and in *phthisis*, this substance has been highly praised by many as being almost a complete specific, but its efficacy in these diseases has not been well established.

Dose and Mode of Administration.—Min. j. to min. ij. gradually increased to min. v. or min. vj. dissolved in at least an ounce, or an ounce and a half of some aromatic water; or made into an emulsion with distilled water by means of sugar or yolk of egg. In the administration of creasote, it should be borne in mind that its action is temporary, and consequently that the dose should be frequently repeated.—*Mistura Creasoti*, E. (Creasote; and acetic acid, of each, min. xvj.; compound spirit of juniper; and syrup, of each, f℥j.; water, f℥xiv; mix the creasote with the acid, add gradually the water, and lastly, the syrup and spirit). An excellent form for the administration of this medicine, the spirit of juniper concealing its disagreeable taste. Dose, f℥i. to f℥ij.; f℥j. contains min. j. of creasote.

Digitalis has been described in the division *Diuretics*, but as its active principle *digitaline* acts only as a sedative, I have preferred describing the mode of preparation and properties of that substance here.

Preparation.—*Digitaline;* "Take any quantity of dry digitalis, reduce it to coarse powder, and form it into a paste with spirit of the density ·860; separate the tincture by strong pressure, and repeat the operation a second time. Distil the alcoholic liquor and treat the residue with water acidulated with acetic acid; filter and add to the clear liquor a concentrated infusion of nut-galls as long as any precipitate is formed. Collect this precipitate carefully, and triturate it with an equal weight of finely powdered litharge, adding a few drops of spirit. Digest for a short time with rectified spirit (dens. ·840), at a temperature not exceeding 104 °F. Filter, distil off the spirit and agitate the residue with warm sulphuric ether, when the digitaline will be left as an insoluble residuum." Homolle and Henry.

Properties.—*Digitaline* thus prepared is in the form of a white powder; it has an excessively bitter taste, and is inodorous, but the smallest quantity of it produces violent sneezing. It is scarcely soluble in cold water or ether, a little more so in boiling water, but is very soluble in either strong or weak spirit. It is perfectly neutral.

Digitalis administered in large doses acts as a narcotico-acrid poison, producing giddiness, great debility, stupor, slow, feeble and intermittent pulse, an abundant flow of saliva, cold sweats, and death immediately

preceded by coma and convulsions. In medicinal doses, when its use has been continued for some time, it operates as a direct sedative, its influence being chiefly manifested on the heart and arterial system; this is indicated by the diminished force and frequency of the pulse, which is also sometimes irregular, and by the enfeebled action of the heart itself. If the use of digitalis be continued under these circumstances, although the dose be not increased, all the symptoms of poisoning come on, indeed in many cases, will appear some days after its administration has been stopped; hence it is evident that this medicine accumulates in the system, and therefore in cases where its use has been continued for any period, the administration of the remedy should be occasionally suspended, particularly as soon as its constitutional effects become obvious. From the sedative influence which digitalis exerts on the heart, it may be employed in all cases attended with over-excitement of the vascular system: but where much inflammation is present, it is not sufficiently powerful as an antiphlogistic to be relied on, to the exclusion of more active treatment. It is in diseases of the heart and large arteries that this medicine is found most beneficial, and whenever the curative indication will be best fulfilled by diminishing the impulse of the heart, and by lowering the circulation generally, no remedy will produce these results so completely and so certainly as digitalis. It thus proves useful in simple hypertrophy of the heart, in nervous palpitations, in increased action of that organ arising from functional derangement not from organic disease, in aneurism of the aorta, and in active hemorrhages where the pulse is quick, hard and throbbing; its employment is contra-indicated in hypertrophy of the heart with or without dilatation, when that state is produced, by obstruction from any cause to the circulation of the blood, or by regurgitation from insufficiency or other disease of the valves. Digitalis has been also used in cases of insanity and of epilepsy; in the latter affection, when not dependant on organic disease, it often proves singularly beneficial when given in very large doses, so as to bring the system rapidly under its influence; in some cases which I saw with Dr. Corrigan, recovery took place very rapidly under the following mode of employing this remedy:—f℥ij. of the infusion of digitalis were given every night at bed-time until its constitutional effect was produced, which was usually after the fourth or fifth dose; its use was then suspended for two or three nights according to circumstances, and then the same quantity given as before; as soon as the system became affected, the number of fits were diminished, and under the continuance of this plan of treatment for a short time, their recurrence soon ceased altogether. In the employment of digitalis as a medicine, its effects require to be carefully watched, and whenever its use is continued for any length of time, the patient should not be allowed to use any active exertion, and should be seen at least once daily by the medical attendant.

*Digitaline* is about a hundred times more active than digitalis, the sedative properties of which it appears to possess in a concentrated degree; a tenth of a grain having frequently reduced the pulse to 40 beats in the minute in from eight to ten hours after it had been taken. The smallest over-dose of it produces nausea and obstinate vomiting which lasts for many hours.

Dose and Mode of Administration.—As a sedative the dose of the preparations of digitalis are as follows :—of the powder, gr. j. to gr. iij.; of the infusion, f℥i. to f℥ij.; of the tincture, f℥ss. to f℥iss.—*Succus Digitalis,* (Prepared in the same manner as *Succus Conii,* page 261). Dose, f℥i. to f℥ij.—*Extractum Digitalis,* L. E. ("Fresh foxglove leaves, ℔j., bruise them sprinkled with a little water in a stone mortar, then press out the juice, and evaporate it unstrained to a proper consistence," L.—"Best prepared by any of the processes indicated for extract of Conium," E.). An uncertain preparation. Dose, gr. ss. to gr. j. The dose of *digitaline* is from 1-12th. to 1-10th. of a grain repeated every sixth hour, its effects being most carefully watched.—*Granules of Digitaline,* (Digitaline, gr. xx.; powdered white sugar, ʒi.; mucilage, sufficient to make 1000 granules). Each granule contains a fiftieth of a grain of digitaline. Dose, 4 to 5.

In cases of poisoning with foxglove, the stomach pump should be used, or powerful stimulating emetics immediately administered, and active stimulants both external and internal be assiduously employed.

Lauro-cerasus, E. Prunus lauro-cerasus, D.—*Cherry-laurel leaves. Leaves of Prunus lauro-cerasus, (Cerasus lauro-cerasus,* Jussieu); *Common Laurel.* A native of the shores of the Black Sea, whence it was introduced into Europe and the British Isles, where it now grows freely; it belongs to the Natural family *Rosaceæ (Drupaceæ,* Lindley), and to the Linnæan class and order *Icosandria Monogynia.*

Botanical Characters.—An evergreen small tree; Stem smooth, much branched, 12-18 feet high; Leaves, large, bright glaucous green, coriaceous; Flowers, numerous, white, small, in axillary racemes; Fruit, an ovoid, blackish drupe about the size of a small cherry.

Physical Properties.—Cherry-laurel leaves are employed in the recent state for medicinal purposes; they emit an agreeable bitter almond odour when bruised, and have a bitter rather astringent taste.

Chemical Properties.—These leaves have not been accurately analysed; their properties depend on a volatile oil, which they yield by distillation with water; it resembles in odour and other properties the volatile oil of bitter almonds, and like it contains free prussic acid. The leaves differ much in the quantity of this oil which they yield at different periods of their growth, and consequently in their activity; according to Christison the greatest quantity is obtained from the buds and unexpanded young leaves in the months of May and June, at which time they yield 6·33 grains of oil in one thousand; in July the proportion sinks to 3·1 grains, and in the following May to 6·6. Zeller states that they yield more oil when collected in cold wet weather than when gathered in a dry hot season. The water which comes over with the oil in the process of distillation acquires both its odour and taste, and is the only preparation of the plant which is employed in medicine.

*Adulterations.*—Cherry-laurel water varies much in activity according to the time of the year in which it is prepared, and the care with which it is distilled. Its strength is most easily ascertained by the nitrate of silver test as described for prussic acid (page 251). As it loses its activity by keeping, it should be distilled fresh every year.

Therapeutical Effects.—Cherry-laurel leaves and their distilled water, owe their virtues to the prussic acid which they contain, and consequently produce the same effects. An ounce of the distilled water has produced death in an adult. Cherry-laurel water is much employed in this country as a sedative in spasmodic cough, in phthisis, and in painful or spasmodic diseases of children; for the latter purpose its agreeable flavour renders it peculiarly eligible; it is, however, very liable to vary in strength, and therefore should be prescribed with caution.

Dose and Mode of Administration.—*Aqua Lauro-cerasi,* D. E. (Fresh cherry-laurel leaves, ℔j.; water, *by measure* ℔iij. (Oiiss. E.); "distil off ℔j., and add ℥i. of compound spirit of lavender instead of rectified spirit," D. "Chop down the leaves, mix them with water, distil off a pint, agitate the distilled liquid well, filter it if any milkiness remains after a few seconds of rest, and then add ℥i. of compound spirit of lavender," E.). The compound spirit of lavender is added as a colouring ingredient to prevent mistakes from the preparation being taken for common water, the odour, however, is quite sufficient for this purpose; and consequently as prepared in Dublin at present, it is usually omitted, even in that which is sold at the Apothecaries' Hall of Ireland. The dose for adults is from f℥ss. to f℥i.; for infants or children, min. ij. to min. x.

Incompatibles.—Same as for hydrocyanic acid. As is also the treatment in cases of poisoning.

Naphtha medicinalis. *Medicinal Naphtha. (Pyroxylic spirit; Pyro-acetic spirit).*

Preparation.—The mode of preparation of the liquid sold under the above name, and used in medicine in the present day, is kept a secret by the chemists who prepare it; there is no doubt, however, but that it is a product of the destructive distillation of wood.

Physical Properties.—A colourless, transparent, limpid fluid, with an agreeable, ethereal, alcoholic odour, bearing some resemblance to that of acetic ether, and an aromatic, not unpleasant taste. Sp. gr. 0·823 to 0.824.

Chemical Properties.—The chemical characters of medicinal naphtha, are those of pyroxylic spirit *(hydrate of oxide of methule,* Liebig). It is miscible with water and alcohol in all proportions, an increased temperature being produced on its addition to the former. It is very volatile and boils at about 150° F., and is inflammable burning with a pale blue flame. It is perfectly neutral to test paper.

*Adulterations.*—Ordinary naphtha is sometimes substituted for medicinal naphtha (pyroxylic spirit), but may be readily distinguished by the chemical characteristics given above.

Therapeutical Effects.—This remedial agent was first introduced into the practice of medicine by Dr. Hastings who along with the late Dr. Hocken, vaunted it as a perfect cure for pulmonary consumption. They both agreed in describing its effects on the system generally as those of a stimulant, and considered its curative action to depend on its possessing a solvent power over tubercle. Although few, if any, believe now that phthisis can be cured by this agent, it must be confessed that the results of the experience of nearly all who have tried its effects in this disease, is strongly confirmatory of its being a most useful remedy, and in this opinion I fully agree. It appears to me, however, to act as a direct sedative: the harassing cough and troublesome vomiting so frequent an attendant of the advanced stages of consumption, being more relieved by it than by any other remedy I have employed; and it is consequently in cases in which these symptoms are very prominent that it proves most beneficial.

Dose and Mode of Administration.—Min. v. to min. xx. three or four times a day. It may be given in some aromatic water and sweetened with syrup if necessary. The following is the mixture which I ordinarily employ:—*Mistura Naphthæ Medicinalis,* (Medicinal naphtha, f℥ij.; compound tincture of cardamoms, f℥vi.; water, f℥vij.; mix). Dose, f℥ss. every fourth hour.

Potassii cyanidum.—*Cyanide of Potassium. (Cyanuret of Potassium; Hydrocyanate of Potassa).*

Preparation.—*Parisian Codex,* 1837. "Reduce proto-cyanuret of potassium and iron to coarse powder, half fill a retort with it, place the retort in a good reverberatory furnace, adapt the tube to collect the gas; heat moderately to expel the water of crystallization, then raise the temperature so as to fuse the mass, which will be announced by a disengagement of gas; keep up the temperature so that the disengagement will be regular and moderate; increase the heat progressively, and maintain it at a very high degree for a quarter of an hour, close the extremity of the tube, close also the apertures of the furnace, and leave the whole to cool; then break the retort and carefully detach the upper stratum which forms a kind of well-fused enamel. This is the pure cyanide of potassium; include in a well-ground stoppered bottle, remove afterwards the spongy black mass which is found in the lower part; it is a mixture of cyanide of potassium, iron, and charcoal, include it also in bottles." Mr. Donovan of this city has added the following directions to the above process:—The retort should be of forged iron, a quicksilver bottle will answer perfectly, provided it be sound; in its screw plug, must be fitted an iron tube so bent that its other extremity may be plunged half an inch below the surface of a little water in a cup. By this means the different steps may be more easily regulated, as the issue of gas is more conveniently observed. The iron bottle should be only half filled with recrystallized ferrocyanide of potassium; and as soon as the process is completed, when cold it may be cut in two by a chisel and heavy hammer. The black impure cyanide at the bottom of the retort is totally unfit for medicinal use.—It may be also obtained very readily and of great purity by passing a stream of hydrocyanic acid through an alcoholic solution of pure potash: a plan first proposed by Wiggers.

Physical Properties.—Cyanide of potassium, thus procured, is a whitish, semi-transparent, crystalline mass, having an enamelled appearance. It is inodorous when quite dry, but if moistened it emits the odour of hydrocyanic acid. It has an acrid, alkaline, somewhat bitter taste.

Chemical Properties.—It is composed of one eq. of potassium and one of cyanogen. Exposed to the air it absorbs moisture and deliquesces, being converted into carbonate of potash by the absorption of carbonic acid from the atmosphere and the evolution of hydrocyanic acid. It has an alkaline reaction on vegetable colours; is fusible by heat without change, and unalterable even by a white heat, provided air be excluded. This salt is very soluble in water, but is insoluble in strong alcohol. By solution in water it is converted into the hydrocyanate of potassa.

*Adulterations.*—As commonly met with in the shops, this salt is seldom fit for medicinal use. When pure it should be perfectly white and afford a completely colourless solution with distilled water; if it be at all yellow, it contains iron which diminishes its activity much. It should be also perfectly free from odour, as if it have any smell of prussic acid, it contains water, is of uncertain strength, and is perhaps undergoing slow decomposition.

Therapeutical Effects.—Cyanide of potassium possesses precisely similar properties to hydrocyanic acid, as a substitute for which it is used in medicine. Its advantages over that acid are its unvarying strength, and its permanence of constitution, when properly prepared and carefully preserved; but its great liability to deliquesce has prevented its general introduction into the practice of medicine. To remedy this defect, Mr. Donovan has suggested "that consumers should keep the cyanide of potassium in small wide-mouthed well-stoppered bottles, not quite filled with the salt, but completely filled with alcohol of 0·800; which when of this strength exerts scarcely any solvent power on the cyanide, but will effectually preserve it from the deteriorating influence of the air. When a few grains are required for use, they may be drawn up by an iron wire like potassium out of naphtha, and heated in a spoon for a moment to drive off the adhering alcohol."

Dose and Mode of Administration.—The dose of the pure cyanide of potassium is from one-eighth to one-fourth of a grain. If it be desirable to administer the prussic acid contained in the salt in a free state, this may be done by prescribing it in combination with any weak acid, as with citric acid, recent lemon-juice, or syrup of lemons.—*Syrup of Cyanide of Potassium*, Magendie, (Cyanide of potassium, gr. viij.; simple syrup, f℥xvj.; mix). Dose, f℥ij. to f℥vj. It is always better to prescribe this preparation in the form of draughts in consequence of its liability to become decomposed.—*Calmative Lotion*, Trousseau, (Cyanide of potassium, gr. viij.; distilled water; alcohol; and sulphuric ether, of each, f℥i.; mix). For external use only. One-eighth of a grain of pure cyanide of potassium is equal to about one minim of the medicinal prussic acid of the Dublin Pharmacopœia.

Incompatibles.—All acids, and acidulous salts.

Tabacum, L. E. Nicotiana Tabacum, folia, D.—*Tobacco. Leaves (dried, L.) of Nicotiana Tabacum.* A native of America belonging to the Natural family *Solanaceæ*, and to the Linnæan class and order *Pentandria Monógynia.*

Botanical Characters.—A viscid, herbaceous annual; Stem 3-6 feet high, erect, branching at the top; Leaves, sessile, ovato-acuminate, very large, pale green; Flowers, in panicles, rose-coloured; Capsules, two-celled, loculicidal, containing many small somewhat reniform, brown seeds.

Preparation.—In the month of August the plants are cut off above their roots, and dried under sheds; when perfectly dry, the leaves are stripped off, twisted, tied in bundles, and packed with great compression into hogsheads for exportation. Virginia tobacco in leaf should be the kind employed for medical purposes.

Physical Properties.—Virginia tobacco leaves are of a dark brown colour with yellowish spots, and have an unctuous feel. Their odour is peculiarly heavy and narcotic; their taste bitter and nauseous.

Chemical Properties.—Tobacco is composed of a peculiar, liquid, colourless, volatile alkaloid which has been named *nicotina;* of a concrete volatile oil, *nicotianin;* of bitter extractive, gum, chlorophylle, vegetable albumen, gluten, starch, malic acid, and some salts. Its properties depend on the alkaloid and the volatile oil; the former is heavier than water, has the odour of tobacco, and an acrid, burning taste, so intense as to communicate it perceptibly to 10,000 parts of water; the latter has also the odour of tobacco, its taste is bitter and aromatic, leaving an unpleasant sensation in the throat, it does not exist in recent tobacco leaves, and therefore must be developed during the process of drying. By burning tobacco an *empyreumatic oil* is produced from the decomposition of some of its constituents; it is usually found in pipes, which have been used some time for smoking, it is a very active poison. Tobacco leaves yield their properties readily to boiling water, alcohol, and spirituous liquors.

The adulterations of tobacco are unimportant in relation to its medical employment.

Therapeutical Effects.—Tobacco taken internally in large doses acts as a powerful narcotico-acrid poison; the most marked symptoms are nausea, fainting, great exhaustion, general relaxation both of the voluntary and involuntary muscles, extreme depression of the circulatory powers (marked by the feeble fluttering pulse, cold extremities, paleness of the face, &c.), convulsions, paralysis, and death. In very small doses it is said to act as a diuretic, and sometimes as a laxative. In full medicinal doses, it operates as a direct sedative of the vascular system, and also of the cerebral functions. It is principally used in medicine to relax the muscular fibres:—thus it is employed in the form of enema, in strangulated hernia, in stricture or obstruction of the bowels from other causes, in retention of urine from spasmodic stricture of the urethra, or from spasm of the neck of the bladder, in obstinate constipation, in severe colic, and in tetanus; in all of which diseases its beneficial effects depend on its relaxing influence over the muscular system. Tobacco was formerly employed as a diuretic in dropsy, and also as an anthelmintic, but in the present day it is rarely used for either purpose.

As an external agent the infusion or decoction may be applied by means of compresses in any of the cases above enumerated in which its sedative action is indicated; and in America an ointment is used in chronic cutaneous diseases, especially those of the scalp, but its use requires very great caution, as it has in some instances produced fatal results; for the same reason although a certain application for the destruction of vermin, the infusion of tobacco is but seldom employed for that purpose.

Dose and Mode of Administration.—The use of tobacco requires great caution, as, in order to produce a sedative influence, its poisonous effects must be partially induced. For the preparation of an enema of tobacco, formulæ are given in the three British Pharmacopœias, but in no instance should a larger quantity be used at first than from gr. xv. to gr. xx. infused in Oi. of boiling water, for cases are on record where so small a quantity as ʒj. and even ʒss. has proved fatal.—*Enema Tabaci*, L. E.—*Infusum Tabaci*. D. (Tobacco, ʒi. (gr. xv. to ʒss. E.); boiling water, *by measure* ℔j. (Oj., L. fʒviij., E.); macerate (digest in a close vessel, D.) for one hour (half an hour, E.), and strain).—*Vinum Tabaci*, E. (Tobacco, ʒj.; sherry, fʒxij.; digest for seven days; strain, express strongly the residuum, and filter the liquors). Sedative and diuretic, but rarely used; Dose, min. x. to min. xl.

In cases of poisoning with tobacco, if the poison have been swallowed, emetics should be immediately administered; and in all cases the most powerful stimulants, both external and internal, should be employed. The vegetable astringents have been proposed as antidotes for tobacco, tannin forming an insoluble precipitate with *nicotina*.

Zinci cyanidum. *Cyanide of Zinc. (Cyanuret of Zinc; Hydrocyanate of protoxide of Zinc).*

Preparation.—Pass the vapour of prussic acid into distilled water in which is suspended recently prepared hydrated oxide of zinc, which is obtained by adding in excess, water of caustic potash to a solution of chloride of zinc.

Properties.—It is a solid white salt, inodorous and insipid; is composed of one eq. of cyanogen, and one of zinc; and is insoluble in both water and alcohol.

Therapeutical Effects.—This preparation has been proposed on the continent as a substitute for hydrocyanic acid or the cyanide of potassium. The dose is from gr $\frac{1}{4}$ to gr. j., but its insolubility renders it an objectionable preparation. In Germany it has been employed as an *anthelmintic* for children.

# CHAPTER XVIII.

## SIALOGOGUES.

### (Masticatories).

Sialogogues are substances, which by a *local* stimulant action augment the secretion of saliva. By this definition we exclude the so called *remote* or *specific* sialogogues as the preparations of mercury, gold, &c., which generally produce an increased flow of saliva, when their internal use has been continued for some time; but as their remediate powers do not depend merely on the increase of this secretion, it will, I think, be more practical to confine the term *sialogogue* to those agents which are employed as direct stimulants to the salivary glands. There are but few substances used in the present day in the practice of medicine for this purpose, and their application to the treatment of disease is very limited.

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Armoracia, L. E. Cochlearia armoracia, radix, D. *Horse-radish. The fresh root of Cochlearia armoracia.* Indigenous; belonging to the Natural family *Cruciferæ (Brassicaceæ,* Lindley), and to the Linnæan class and order *Tetradynamia Siliculosa.*

Botanical Characters—Roots perennial, fleshy, white, running deep into the ground; Stems, about 2 feet high; Leaves large, much veined; Flowers, white.

Physical Properties.—When bruised or cut, the fresh root emits a very acrid penetrating odour; it has a very pungent taste. The acrimony of the roots is lost by drying, but they may be preserved fresh for a long time by keeping them packed in sand in a damp cellar.

Chemical Properties.—The active principle of horse-radish is a very acrid volatile oil, which may be obtained by distillation. The root yields its acrimony to both boiling water and alcohol; but it is dissipated by boiling.

Therapeutical Effects.—Horse-radish root is an excellent sialogogue, producing a copious secretion of saliva. It has been sometimes employed in paralysis of the tongue, but like the other remedies of this class, it has nearly fallen into disuse.

Mezereon (described in the division *Diaphoretics)*, has been occasionally used as a masticatory in tooth-ache and in difficulty of deglutition from paralysis. A small piece of the bark should be frequently chewed and the saliva assiduously rejected.

Pyrethrum, D. L. E. *Pellitory of Spain. Root of Anacyclus pyrethrum*, E.—*of Anthemis pyrethrum*, D. L. A native of Asia Minor, and of the central parts of Europe; belonging to the Natural family *Compositæ (Asteraceæ*, Lindley), and to the Linnæan class and order *Syngenesia Superflua.*

Botanical Characters.—Root fusiform; Stems, several, procumbent, somewhat branched, pubescent; Branches, one headed; Florets of the ray, white above, purplish beneath; of the disc yellow.

Physical Properties.—It is in short tapering pieces, from 3 to 4 inches in length and about the thickness of the little finger. The bark is thick and of a dark brown colour with black shining spots; the internal structure is dirty yellow with a radiated appearance. It is inodorous, but when chewed produces a peculiar pricking sensation on the tongue and lips.

Chemical Properties.—According to Parisel's analysis, the acrimony of this root depends on an acrid resin *Pyrethrin*, of which it contains 3 per cent; the other constituents are, inulin, gum, tannin, colouring matter, lignin, a trace of iron and silica, and some salts. It yields its virtues to alcohol and ether, but not to water.

Therapeutical Effects.—Pellitory root is the most useful of this class of remedies, acting as a powerful local stimulant to the salivary glands, and causing a copious secretion of saliva. It is used for this purpose in tooth-ache, neuralgia of the face, rheumatism of the jaws and paralysis of the tongue; in the latter of which affections I have employed it with benefit in more than one instance. It has been also employed in relaxation of the uvula. From 3ss. to 3i. of the root may be chewed frequently. A tincture prepared by macerating for 7 days one part of the powdered root in five parts of rectified spirit and one of water, is used by some dentists to relieve tooth-ache.

# CHAPTER XIX.

## GENERAL STIMULANTS.

(Excitants; Incitants).

It is difficult to define what is understood in the practice of medicine by the term Stimulant, excitement of the vital energies is produced by such different means under different circumstances; with no class of remedies, therefore, is it more necessary to bear in mind the truth of the maxim, that medicines act merely *relatively*. In their mode of action when administered internally, General Stimulants resemble in some respects Tonics; thus, immediately after their administration, a feeling of tone or increased power is produced, which, however, is not permanent, but is almost invariably followed by a corresponding depression of vital power; their effects also are more immediate and more manifestly perceived by the senses than those of Tonics. Many of the remedies contained in this division are closely related to Narcotics, for example, alcohol and the ethers; the secondary effect of both of which, particularly if given in large doses, is to produce sleep and coma; this does not, however, appear to be, as with Narcotics, from any direct action on the nervous system, but rather to result from the previous over-excitement of the vital energies. The great number of medicines contained in this class, and the material difference of their action in relation to the particular effects which they produce on the animal economy, preclude us from laying down any general rule as to their administration in disease. The peculiarities in their mode of operation will be more conveniently considered when treating of the therapeutical effects of each article.

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Acidum aceticum camphoratum, D. E. *Camphorated acetic acid.* An officinal substitute for aromatic vinegar.

Preparation.—"Camphor, ℥ss.; acetic acid, f℥vj. (f℥viss., E.); pulverise the camphor with the aid of a little rectified spirit, and dissolve it in the acetic acid."

This preparation is employed only as an external stimulant, the vapour being snuffed up the nostrils in syncope. It is exceedingly pungent and very volatile, and should be therefore kept in well stopped bottles.—*Aromatic Vinegar* of the shops is a solution of camphor, and the volatile oils of cloves, lavender, and rosemary in the strongest acetic acid; its odour is more agreeable than that of the officinal preparation.

Acidi nitrici unguentum, D. *Nitric acid ointment.* This ointment is employed as a local stimulant in chronic cutaneous diseases, particularly those which affect the scalp, and as an application to ulcers of a syphilitic origin. It is said to be most efficacious when recently prepared.

Preparation.—*Dub.*—"Olive oil, ℔j.; prepared hog's-lard, ℥iv.; nitric acid, f℥vss.; melt the oil and lard together in a glass vessel, and when they are beginning to concrete, add the acid, then stir constantly with a glass rod until they become firm."

Æther aceticus. *Acetic ether.* Not employed in this country, but officinal in most of the Continental Pharmacopœias.

Preparation.—*Parisian Codex.* "Rectified spirit, 100 parts; concentrated acetic acid, 63 parts; strong sulphuric acid, 17 parts; mix, and distil over a sand bath, 125 parts; deprive this of any free acetic acid it may contain by means of carbonate of potash, set aside until it settles, pour off the clear liquor and distil 100 parts."

Physical Properties.—It is a colourless, transparent, very volatile liquid, with an agreeable, refreshing odour, and a warm ethereal taste, leaving a cooling impression on the palate. Sp. gr. 0·860.

Chemical Properties.—According to the recent chemical theories as to the constitution of the ethers, acetic ether is an *acetate of oxide of ethyl*, its composition is $C^8H^8O^4$, or $C^4H^5O+C^4H^3O^3$; it boils at 165°. It is soluble in 7 parts of water, and in alcohol and ether in all proportions. Acetic ether when free from water, may be kept unchanged in stoppered bottles, but if it contain water, it rapidly decomposes into acetic acid and alcohol; the alkalies decompose it with great facility.

Therapeutical Effects.—Acetic ether is an agreeable but mild general stimulant, at one time much used on the Continent in hysteria and nervous affections; at present it is chiefly employed externally as an ingredient in stimulating liniments.—*Camphorated Acetic Liniment*, Pelletier. (Soap, and camphor, of each, ℥ij.; acetic ether, f℥ij.; dissolve in a water bath, and add oil of origanum, min. xx). An excellent stimulating liniment in rheumatic and arthritic pains, and in sciatica.

ÆTHER NITROSUS, D. *Nitrous ether. Hyponitrous ether; Nitric ether; Nitrite of oxide of ethyl.*

PREPARATION.—*Dub.*—"Take of nitrate of potash, purified, dried, and reduced to coarse powder, ℔iss.; sulphuric acid, ℔i.; rectified spirit, *by measure* ℥xix.; put the nitre into a tubulated retort placed in a bath of cold water, and pour on it gradually and at intervals the sulphuric acid and the spirit previously mixed and cooled. Without any heat, or at most, a very gentle one, (as of warm water added to the bath), an ethereal liquor will begin to distil; and in a short time the heat in the retort will spontaneously increase, and brisk ebullition take place, which is to be moderated by adding cold water to the bath; the receiver must be kept cold with water or snow, and must be fitted with a proper apparatus for transmitting the very elastic vapour from the mixture (which sometimes bursts forth with great violence if the heat be much increased), through ℔j. of rectified spirit contained in a cooled bottle. The ethereal liquor thus spontaneously distilled, is to be received in a bottle with a glass stopper, and add to it gradually (closing the bottle after each addition), a sufficient quantity of dry carbonate of potash to saturate the excess of acid, litmus-paper being used as a test; this is effected by about a drachm of the salt, and after a short interval the nitrous ether will float on the top, and is to be removed by means of a funnel. If the ether be required very pure, distil it again to one half from a water-bath at a temperature of 140°. Its specific gravity is to that of distilled water, as 900 to 1000."

PHYSICAL PROPERTIES.—Nitrous ether is a volatile liquid, of a pale yellow colour, with an agreeable, very fragrant odour, and a sweetish, cooling, somewhat acid taste. When quite pure its sp. gr. is ·947 at 59° F.

CHEMICAL PROPERTIES.—Its composition is $C^4H^5O^4N$, or $C^4H^5O + NO^3$. It boils at 70°; and is very inflammable, burning with a bright flame. It requires for its solution 48 parts of water, but is miscible in all proportions with alcohol and ether. It is readily decomposed by the alkalies.

THERAPEUTICAL EFFECTS.—Nitrous ether is a general stimulant, resembling in its operation sulphuric ether; but in consequence of the difficulty of preparing it, as well as its tendency to decompose by keeping, it is seldom if ever used in the present day. The dose of it would be from min. x. to min. xxx. frequently repeated.—*Spirit of Nitric Ether* (described in the division *Diuretics*), is sometimes employed as a stimulant in flatulent colic and in spasmodic vomiting, in doses of from f℥ss. to f℥j. frequently repeated.

ÆTHER SULPHURICUS, D. L. E. *Sulphuric ether. Ether. Oxide of ethyl.*

PREPARATION.—*Dub.*—First prepare *sulphuric ethereal liquor* as follows:—"Take of rectified spirit and sulphuric acid, of each, ℥xxxij. *by weight;* put the spirit into a glass retort that will bear the sudden application of heat, and pour on it the acid in a steady stream; mix them gradually and distil with a sudden and sufficiently strong heat, ℥xx. *by measure* of the liquor into a cool receiver. If ℥xvj. of rectified spirit be poured on the acid remaining in the retort, more sulphuric ethereal liquor will be obtained by distillation. Take of this liquor, f℥xx.; carbonate of potash, dried and powdered, ℥ij.; mix them, and from a very high retort distil with a very gentle heat into a cooled receiver

f℥xij. The specific gravity of the liquor should be to that of distilled water, as 765 to 1000." *Lond.*—"Take of rectified spirit ℔iij.; sulphuric acid, ℔ij.; carbonate of potash previously ignited, ℥i.; pour ℔ij. of the spirit into a glass retort, add the acid to it and mix. Afterwards place it on sand, and raise the heat so that the liquor may quickly boil, and the ether pass into a receiving vessel cooled with ice or water; let the liquor distil until some heavier portion begins to pass over. To the liquor which remains in the retort after the heat has subsided, pour the remainder of the spirit that ether may distil in the same manner; mix the distilled liquors, then pour off the supernatant portion, and add to it the carbonate of potash, shaking them frequently during an hour. Lastly, let the ether distil from a large retort, and be kept in a stopped vessel." *Edin.*—"Take of sulphuric acid, f℥x.; rectified spirit, f℥l.; pour f℥xij. of the spirit gently over the acid in an open vessel, and then stir them briskly and thoroughly; transfer the mixture immediately into a glass matrass connected with a refrigeratory, and raise the heat quickly to about 280°. As soon as the ethereal fluid begins to pass over, supply fresh spirit through a tube into the matrass in a continuous stream, and in such quantity as to equal the volume of the fluid which distils over. This is best done by connecting one end of the tube with a graduated vessel containing the spirit, passing the other end through a cork fitted into the matrass, and having a stop-cock on the tube to regulate the discharge. When the whole spirit has been added, and f℥xlij. have distilled over, the process may be stopped; agitate the impure ether with f℥xvj. of saturated solution of muriate of lime, containing also ℥ss. of lime recently slaked. When all odour of sulphurous acid has disappeared, pour off the supernatant liquid and distil it with a gentle heat so long as what passes over has a density not higher than 735. More ether of equal strength may be obtained from the muriate of lime; and from the residuum of each distillation a weaker ether may be obtained in small quantity, which must be rectified by distilling it gently again."

Physical Properties.—Ether is a transparent, colourless, very mobile liquid, with a fragrant penetrating odour, and a pungent aromatic taste, leaving a sense of coldness on the tongue and palate. The Sp. gr. of the London preparation is ·750.

Chemical Properties.—Its composition is $C^4H^5O$ or EO, being an oxide of *ethyl*. It is extremely volatile; it boils between 96° and 98°; is highly combustible, burning with a white flame and the formation of carbonic acid and water. Great cold is produced by its evaporation. When recently prepared, ether is perfectly neutral, but soon becomes acid by keeping. One part of ether dissolves in 10 parts of water, while 36 parts of ether dissolve 1 of water; it combines in all proportions with alcohol. It dissolves most resins, the volatile oils, and many of the vegetable alkaloids.

*Adulterations.*—Ether frequently contains water and alcohol, from bad keeping acetic acid also is often present. The latter may be detected by the effect on litmus paper, and water by the density being higher than that indicated by the Colleges. The presence of alcohol, as well as the quantity if it be present, is satisfactorily ascertained by the test of the *Edinburgh Pharmacopœia*:—"When agitated in a minim measure with half its volume of concentrated solution of muriate of lime, its volume is not lessened." If the solution of ether in water be not perfectly transparent, the presence of ethereal oil may be suspected.

Therapeutical Effects.—The action of sulphuric ether when taken internally is that of a general diffusible stimulant; its effects, which are rapidly produced, are equally transient. In very large doses it is a nar-

cotic poison, producing death with symptoms similar to those caused by alcohol. Applied externally, its action is refrigerant owing to the cold produced by its immediate evaporation. As a stimulant, ether is chiefly employed in spasmodic and nervous affections unaccompanied by inflammation; thus, it is employed with benefit in cramp of the stomach, in spasmodic or flatulent colic, in nervous palpitations, in hiccup, in nervous head-ache, during a paroxysm of spasmodic asthma, &c. It is also administered frequently with good effect in the advanced stages of fever when subsultus tendinum and hiccup are present; and as an immediate stimulant in fainting and asphyxia. In the employment of ether as a stimulant, the transient nature of its operation should be borne in mind, and consequently that the doses require to be repeated at short intervals. The influence of ether over the system is much diminished by habit, therefore it should be administered to those who are accustomed to its use in much larger doses. Externally it has been applied with friction as a local stimulant in rheumatic and neuralgic pains. In pharmacy ether is employed to extract the active principles of many medicines.

Dose and Mode of Administration.—f℥ss. to f℥ij.; it is usually administered in some aromatic water. "Ether may be readily incorporated with water or any aqueous vehicle by rubbing it up with spermaceti, employed in the proportion of gr. ij. for each fluid drachm of the ether," (*U. S. dispensatory*). The vapour of ether disengaged by adding it to some warm water, is inhaled in spasmodic affections of the respiratory organs.—*Spiritus Ætheris Sulphurici*, E. (Sulphuric ether, Oj.; rectified spirit, Oij.; mix them together. "Density 809; it does not affect litmus paper, or render water muddy; when agitated with twice its volume of concentrated solution of muriate of lime, 28 per cent of ether separate by rest"). Uses and properties similar to those of ether. Dose, f℥i. to f℥iij. It is miscible with water in all proportions.—*Liquor Ætherеus Oleosus*, D. *Oleum Ætherеum*, L. ("Take what remains in the retort after the distillation of sulphuric ether, and distil down to one half with a moderate heat," D.—"Rectified spirit, ℔ij.; sulphuric acid, ℔iv.; solution of potash, and distilled water, of each, f℥i. or as much as may be sufficient; mix the acid cautiously with the spirit. Let the liquor distil until a black froth arises, then immediately remove the retort from the fire, separate the lighter supernatant liquor from the heavier one, and expose the former to the air for a day; add to it the solution of potash first mixed with water, and shake them together. Lastly, when sufficiently washed, separate the ethereal oil which subsides," L.). This preparation is only employed as an ingredient in the following compound:—*Spiritus Ætheris Sulphurici compositus*, L. (Sulphuric ether, f℥viij.; rectified spirit, f℥xvj.; ethereal oil, f℥iij.; mix). Commonly known as *Hoffman's anodyne liquor*; it is used in nearly the same cases as sulphuric ether, but its properties are more decidedly anti-spasmodic; the dose is f℥ss. to f℥ij. It is miscible with water in all proportions. This preparation is often prescribed in combination with laudanum, the disagreeable subsequent effects of which it is said to prevent.

In cases of poisoning with ether, the stomach pump should be immediately had recourse to; cold affusion, and the most powerful internal and external stimulants assiduously employed; in extreme cases, artificial respiration should be effected.

ALCOHOL, D. L. E. *Absolute alcohol of the density* 794-6, E.—*Alcohol with a small proportion of water, density* 810, D., 815, L.

PREPARATION.—*Dub.*—"Rectified spirit, cong. j.; pearl-ashes, dried and still warm, ℔iiiss.; muriate of lime dried, ℔j.; add the pearl-ashes in powder to the spirit, digest the mixture in a close vessel frequently agitating for 7 days; draw off the supernatant spirit and mix it with the muriate of lime. Lastly, distil with a medium heat until the mixture in the retort begins to thicken." *Lond.*—"Rectified spirit, cong. j.; chloride of calcium, ℔j.; put the chloride of calcium into the spirit and when it is dissolved, let Ovij. f℥v. distil." *Edin.*—"Rectified spirit, Oj.; lime, ℥xviij.; break down the lime into small fragments, expose the spirit and lime together to a gentle heat in a glass matrass till the lime begins to slake; withdraw the heat till the slaking be finished, preserving the upper part of the matrass cool with damp cloths; then attach a proper refrigeratory, and with a gradually increasing heat distil off f℥xvij. The density of this alcohol should not exceed 796; if higher, the distillation must have been begun before the slaking of the lime was altogether finished."

PHYSICAL PROPERTIES.—Alcohol is a transparent, colourless liquid, with a pungent, rather agreeable odour, and an acrid burning taste. Its density varies with the quantity of water it contains; that of the strong spirit of the pharmacopœias has been given above. RECTIFIED SPIRIT (*Spiritus rectificatus*, D. L. E.) is an article of the Materia Medica; the Dublin College fixes its specific gravity at ·840 at 60° F.; the London College at ·838 at 62° F.; and the Edinburgh College at ·838 at 60° F.—PROOF SPIRIT (*Spiritus tenuior*, D. L. E.) is also an article of the Materia Medica, but as met with in commerce, it is unfit for medical use in consequence of its containing essential oil. The three Colleges have, therefore, directed it to be prepared "by mixing together $5\frac{1}{4}$ parts *by measure* (Ov. L. Ovj. E.) of rectified spirit, with 3 parts, *by measure* (Oiij. L, E.) of distilled water, at a temperature of 60° (62°, L.)." Its specific gravity according to the laws of the kingdom, is ·920° at 60° F.; and it is obtained of this strength by the direction of the London College; the Dublin College fixes it at ·919, the Edinburgh at ·912, at 60° F.

CHEMICAL PROPERTIES.—Absolute alcohol is a *Hydrated oxide of ethyl*; its composition is $C^4\ H^5\ O + HO$, or $EO + HO$. It boils at 173°; it is very volatile, and is highly inflammable, burning with a pale blue flame, free from smoke, water and carbonic acid being the products of its combustion; it has never been frozen. It attracts water from the air and therefore becomes weak if kept in an imperfectly closed vessel; it is miscible with water in all proportions, a disengagement of heat, a diminution of bulk, and an increase of density accompanying their union. Alcohol dissolves the caustic alkalies and alkaline sulphurets; it also dissolves all the deliquescent inorganic salts, except carbonate of potash, but none of the salts which are insoluble or sparingly soluble in water, nor efflorescent salts. It likewise dissolves many vegetable substances, as all essential and most fixed oils, the vegetable alkaloids, sugar, resins, extractive, &c., for many of which purposes it is employed in pharmacy. Alcohol prevents the putrefaction of animal substances which are immersed in it, and hence its employment in the preservation of anatomical preparations. *Rectified* and *Proof spirit* have similar properties to alcohol,

their taste is milder, their boiling point higher according to the state of dilution, their inflammability less, and the colour of the flame with which they burn deeper yellow the more water they contain. *Proof spirit* is defined by law to be such, that at the temperature of 51° F., 13 volumes of it weigh exactly as much as 12 volumes of water; 100 parts of spirit of this strength consist of 49 parts by weight of absolute alcohol, and 51 parts by weight of distilled water at 60° F.

*Adulterations.*—The specific gravity is a sufficient test of the strength of alcohol and the weaker spirits, but in ascertaining their density, the temperature should be at the same time carefully noted, for the lower the temperature, the greater will be the density of the spirit. The rectified spirit of British commerce frequently contains *oil of grain,* a contamination derived from the corn during the process of distillation. Its presence is readily detected by the test of the *Edinburgh Pharmacopœia,* "fʒiv. treated with 25 minims of solution of nitrate of silver (gr. j. to gr. xl. of water), exposed to bright light for 24 hours, and then passed through a filter purified by weak nitric acid, so as to separate the black powder which forms, undergo no farther change when again exposed to light with more of the test." The same test is applicable to both alcohol and proof spirit.

Therapeutical Effects.—Alcohol is the intoxicating principle of all spirituous liquors; in moderate doses properly diluted it acts as a general stimulant, exciting particularly the vascular and nervous systems; in somewhat larger doses it produces the well known effects of intoxication; and in excessive doses it acts as a powerful narcotic poison, rapidly causing death preceded by slow pulse, contracted pupils, and coma. This effect is most usually observed when a large quantity of ardent spirits has been drank at once. As a stimulant, alcohol is employed in medicine to support the vital powers in the advanced stages of fevers, particularly those of a typhoid character; for this purpose brandy or whiskey are usually employed, but wine is generally preferred, (see *Vinum).* It is also often used in flatulent colic, in indigestion, in vomiting, and in fainting. As an external stimulant, it is a common ingredient in lotions, for sprains and bruises, for many forms of external inflammations—as erysipelas and erythema, for various skin diseases, to prevent excoriations in parts exposed to prolonged pressure, and with friction over the region of the heart in syncope and suspended animation. Diluted with six parts *by measure* of water, it has been used as an injection after tapping for the radical cure of *hydrocele.* In consequence of its producing cold by evaporation, alcohol is frequently added to cooling and evaporating lotions.

Dose and Mode of Administration.—In fevers, brandy or whiskey is given in the form of punch; the quantity which should be given depends so much on the circumstances of each particular case, that it would be impossible to lay down here any general rule on the subject. In the fever which proved so fatal to the British Legion in Spain in the year 1835, Dr. Lardner frequently gave so much as 32 ounces of brandy in the 24 hours.—*Mistura spiritus vini gallici,* L. (Brandy; cinnamon water, each, fʒiv.; the yolks of two eggs; purified sugar, ʒss.; oil of cinnamon, min. ij.; mix). An agreeable and excellent stimulant in doses of fʒss. to fʒiss.

In poisoning with ardent spirits, the contents of the stomach should

be immediately evacuated by means of the stomach-pump, and external stimulants, especially the cold affusion, assiduously employed. The coma of ordinary intoxication is best treated by the internal use of ammonia, or of the solution of the acetate of ammonia; if apoplectic symptoms be present, cold lotions to the head, the application of leeches to the temples, and warmth to the extremities, will be found most useful.

AMMONIACUM, L. E. HERACLEUM GUMMIFERUM, GUMMI-RESINA, D. *Gum-ammoniac. Gum-resin (Gummy resinous exudation,* E.) *of Dorema ammoniacum,* L. E.—*of Heracleum gummiferum,* D. The plant indicated by the London and Edinburgh Colleges which is the true source of this drug, as met with in commerce, is a native of Persia; but the ammoniacum of the ancients was procured from the *Ferula orientalis,* a native of Morocco, in which country it is obtained from it even in this day. They both belong to the Natural family *Umbelliferæ (Apiaceæ,* Lindley), and to the Linnæan class and order *Pentandria Digynia.*

BOTANICAL CHARACTERS.—A glaucous-green plant, 4-7 feet high; Stem about 4 inches in diameter, branching; Leaves, large, 2 feet long, on downy petioles, sheathing at the base; Flowers, white, in proliferous, racemose umbels.

PREPARATION.—The gummy juice which pervades the whole plant oozes forth on the slightest puncture. During the warm season, the branches and stem are attacked by innumerable beetles, by which it is pierced in all directions; through these punctures the juice exudes, and soon concretes into a hard gum, when it is picked off by the country people.

PHYSICAL PROPERTIES.—Ammoniac is met with in various sized roundish tears, or in masses composed of the tears agglutinated together. They are of a yellowish or reddish-yellow colour externally, internally they are white and shining like enamel, hard and brittle, and vary in size from that of a small pea to that of a walnut. The odour is peculiar, faintly nauseous, more powerful when heated; the taste is bitter and disagreeable.

CHEMICAL PROPERTIES.—Ammoniac is a gum-resin containing about 80 per cent of resin, and about 18 per cent of gum, with a trace of volatile oil. It is softened by exposure to heat, is inflammable and burns with a white flame. It does not dissolve in water, but is miscible with it forming a milky emulsion, the gum which is soluble suspending the resin in the mixture. It is soluble in both ether and alcohol.

THERAPEUTICAL EFFECTS.—Ammoniac is a general stimulant of but little power; its effects were at one time generally believed to be chiefly manifested on the respiratory organs, and consequently it was classed amongst expectorants, and employed in chronic bronchitis; but any benefit that may have resulted from its use as such, must have depended on its general stimulant properties. It possesses some anti-spasmodic powers, but is much inferior as such to the other fetid gum-resins. In the present day it is very generally and very properly employed, only as an external stimulant in the form of plaster, to scrofulous tumours, chronic enlargement of the joints, indolent glandular swellings, &c, in which it often proves useful.

Dose and Mode of Administration.—Gr. x. to ʒss. in pills or made into an emulsion with milk or water.—*Mistura Ammoniaci,* D. L. ("Gum-ammoniac, ʒj.; penny-royal water, fʒviij.; rub the gum with the penny-royal water gradually poured in, until the mixture assumes the appearance of milk, and strain through linen," D.—"Ammoniacum, ʒv; water, Oj.; rub the ammoniacum with the water gradually poured in, until they are perfectly mixed," L.) This mixture has a milky appearance, the resin being suspended in the water by means of the gum. It was formerly commonly employed as the basis of expectorant mixtures in chronic chest affections. Dose, fʒss. to fʒj.—*Emplastrum Ammoniaci,* D. L. E. ("Pure gum-ammoniac, ʒv.; vinegar of squill, ℔ss.," D.—"Ammoniacum, ʒv.; distilled vinegar, fʒviij. (fʒix., E.)," L. E. Dissolve the ammoniacum in the vinegar; then evaporate the liquor with a slow fire, constantly stirring, to a proper consistence).—*Emplastrum Gummosum,* E. (Litharge plaster, ʒiv.; ammoniac; galbanum; and bees' wax, of each, ʒss.; melt the gum-resins together, and strain them, melt also together the plaster and wax, add the former to the latter mixture, and mix the whole thoroughly). These plasters should be spread on leather for application; when left on for some time, they often produce an eruption of small pimples.

Ammoniæ causticæ aqua, D. Ammoniæ liquor, L. Ammoniæ aqua, E. *Diluted aqueous solution of ammonia* (described in the division *Antacids*), is a general stimulant, prompt, but temporary in its action. It is principally used in typhus fever where there is great deficiency of nervous power; in the advanced stages of continued fever when all inflammatory action has subsided; in the cold stage of intermittents; in the eruptive fevers where the eruption has receded from the skin; and in the latter stages of pneumonia if there be much depression of the vital powers. Owing to its stimulant operation, ammonia is also found useful in spasmodic affections which depend on the increased irritability that accompanies depression of the nervous system, as in hiccup, subsultus tendinum, and some forms of hysteria, and of asthma. It is the best internal stimulant that can be employed in the coma of intoxication, and in poisoning with *sedatives.* As an external stimulant, the vapour of ammonia is inhaled in syncope, and in asphyxia. Solution of ammonia may be given as a stimulant in the same doses as directed in the division *Antacids*; but it should be given repeatedly, and at shorter intervals.

Ammoniæ carbonas. *Sesqui-carbonate of ammonia* (described in the division *Antacids),* is employed as a stimulant in the same cases as the aqueous solution of ammonia, to which it is usually preferred. The chief advantage that ammonia and the sesqui-carbonate possess as stimulants in febrile diseases is, that they rouse the energies of the system without producing that disturbance of the brain, which is liable to result from the use of vinous liquors. Dose, gr. v. to gr. xv. dissolved in camphor mixture, or any simple vehicle every 4 or 5 hours. It should not be

administered in the solid state from its liability to produce vomiting when thus given.

AMMONIÆ HYDROSULPHURETUM, D. *Hydrosulphuret of ammonia. Hydrosulphate of ammonia.*

PREPARATION.—"Sulphuret of iron in coarse powder, 5 parts; sulphuric acid, 7 parts; water, 32 parts; water of caustic ammonia, 4 parts; put the sulphuret into a retort, then gradually pour on it the acid previously diluted with water, and having fitted on a proper apparatus transmit the gas through the water of ammonia. Towards the end of the process apply a moderate heat to the retort."

PROPERTIES.—A greenish-yellow, very fetid liquid, emitting an odour of sulphuretted-hydrogen gas, having an acrid, very disagreeable taste. It is a solution of the neutral hydrosulphate of ammonia in water. Exposed to the air it deposits sulphur owing to the escape of some of the ammonia; and on the addition of any of the mineral acids, sulphuretted-hydrogen gas is evolved.

THERAPEUTICAL EFFECTS.—This preparation has nearly fallen into disuse. It was formerly employed with the idea of de-oxygenising the system in diabetes, as also of diminishing the morbid appetite of that disease. It possesses some slight stimulant properties, but might be well spared from the pharmacopœia. The dose is from min. iv. to min vj. in one or two fluid ounces of some distilled or aromatic water.

AMMONIÆ MURIAS, D. E. AMMONIÆ HYDROCHLORAS, L. *Muriate of ammonia. Hydrochlorate of ammonia. Chloride of ammonium. Sal-ammoniac.*

PREPARATION.—An article of the Materia Medica. It is procured by the manufacturers on the large scale, by decomposing the sulphate of ammonia which is formed in the manufacture of coal gas, or from the carbonate of ammonia obtained by the distillation of bones. In either case, the decomposing agent employed is common salt (chloride of sodium).

PHYSICAL PROPERTIES.—This salt generally occurs in large crystalline cakes, convex on one side, concave on the other, of a greyish-white colour, semi-transparent. It is tenacious, and difficult to reduce to powder; inodorous, with a pungent, acrid, bitter taste. Sp. gr. 1·45.

CHEMICAL PROPERTIES.—It is composed of 1 eq. of chlorine, 2 of hydrogen, and 1 of amidogene, its formula being Cl, 2 H, $NH^2$, (Kane). It is permanent in the air; exposed to heat it sublimes unchanged. It is soluble in 2·72 parts of water at 60°, and in its own weight of boiling water; it is also soluble in alcohol. During its solution in water, a great degree of cold is produced. This salt is best characterised by the evolution of gaseous ammonia, which takes place when it is rubbed in a mortar with quicklime.

THERAPEUTICAL EFFECTS.—Hydrochlorate of ammonia is not much employed in this country as an internal remedy; but on the continent,

especially in France and Germany, it bears a high character as a stimulant in mucous fevers as soon as the acute inflammatory symptoms have subsided, in the slighter cases of inflammations of the serous membranes, in the milder forms of pneumonia and of hooping cough, in mucous diarrhœa, in chronic rheumatism and gout, and in passive dropsies. I have found it useful in some cases of adynamic fever, and the subacute forms of laryngitis. M. Cless has employed it extensively in the early stages of tubercular phthisis, and he states with the most decidedly beneficial results. As a topical remedy muriate of ammonia is very generally employed as an ingredient in discutient lotions, and in consequence of the cold produced during its solution in water, as an external refrigerant.

Dose and Mode of Administration.—Internally, gr. v. to gr. xxx. combined with some aromatic powder, in the form of pill or of bolus, or dissolved in some aromatic water. For external use it may be dissolved in water, or in vinegar in the proportion of from ʒij. to ℥ss. of the salt in a pint of liquid, to which rectified spirit is generally added. A refrigeratory mixture may be prepared, by dissolving 5 parts each of this salt and of nitre in 16 parts of water, which will reduce the temperature forty degrees.

Incompatibles.—Sulphuric and nitric acids; potash, soda, lime, magnesia, and their carbonates; and most metallic salts.

If an overdose of this salt has been taken, vomiting should be promoted by the use of tepid mucilaginous and demulcent drinks.

Ammoniæ spiritus, D. L. E. *Spirit of ammonia. Solution of carbonate of ammonia (of ammonia,* E.*) in rectified spirit.*

Preparation.—*Dub.*—"Rectified spirit, *by measure* ℔iij.; carbonate of ammonia in coarse powder, ℥iiiss.; mix, and dissolve with a gentle heat, then filter." *Lond.*—"Hydrochlorate of ammonia, ℥x.; carbonate of potash, ℥xvi.; rectified spirit; and water, of each, Oiij.; mix, and let Oiij. distil." *Edin.*—"Rectified spirit, Oij.; fresh burnt lime, ℥xij.; muriate of ammonia in very fine powder, ℥viij.; water, f℥viss.; let the lime be slaked with the water in an iron or earthen vessel, and cover the vessel till the powder be cold; mix the lime and muriate of ammonia quickly and thoroughly in a mortar, and transfer the mixture at once into a glass retort; adapt to the retort a tube which passes nearly to the bottom of a bottle containing the rectified spirit; heat the retort in a sand-bath gradually, so long as any thing passes over, preserving the bottle cool. The bottle should be large enough to contain one-half more than the spirit used."

Properties.—A transparent, colourless liquid, with a pungent ammoniacal odour, and an acrid taste. It is very volatile, and acts as an alkali on vegetable colours. The Dublin and London preparations effervesce with the stronger acids. Sp. gr. ·860, L.

Therapeutical Effects.—Spirit of ammonia is a stimulant of some power, and may be used as such in the same cases as the aqueous solution of the gas, or of the sesquicarbonate. Dose, f℥ss. to f℥iss. in some aromatic water, or in camphor mixture. It is generally employed in the following form:—*Spiritus Ammoniæ aromaticus,* D. L. E. ("Spirit of ammonia, *by measure* ℔ij.; essential oil of lemons, ʒij.; nutmegs,

bruised, ʒss.; cinnamon, bruised, ʒiij.; macerate in a close vessel for 3 days, shaking occasionally; then distil ℔iss.," D.—"Hydrochlorate of ammonia, ʒv.; carbonate of potash, ʒviij.; cinnamon, bruised; and cloves, bruised; of each, ʒij.; lemon peel, ʒiv.; rectified spirit; and water, of each, Oiv.; mix, and distil Ovi.," L.—"Spirit of ammonia, fʒviij.; volatile oil of lemons, fʒi.; volatile oil of rosemary, fʒiss.; dissolve the oils in the spirit by agitation," E.). An excellent and agreeable stimulant in fainting, hysteria, nervous debility, and flatulent colic. Dose, min. xxx. to fʒi. in distilled water, or in camphor mixture.—*Tinctura Ammoniæ composita*, L. (Mastich, ʒij.; rectified spirit, fʒix.; oil of lavender, min. xiv,; oil of amber, min. iv.; stronger solution of ammonia, Oj.; macerate the mastich in the spirit that it may be dissolved, and pour off the clear tincture; then add the other ingredients, and shake them all together). A powerful stimulant, chiefly used in hysteria. Dose, min. v. to min. x. in water.

ANETHUM, L. E. *Dill.—Fruit of Anethum graveolens.* A native of the South of Europe; belonging to the Natural family *Umbelliferæ (Apiaceæ*, Lindley), and to the Linnæan class and order *Pentandria Digynia.*

BOTANICAL CHARACTERS.—An annual, 1–2 feet high; Stem, striated; Leaves, decompound, with fine capillary segments; Flowers, yellow.

PROPERTIES.—The fruit, commonly called *dill-seed*, is elliptical, flat, of a brownish colour, with a lighter coloured, thin, membranous margin. The odour resembles caraway; the taste is pungent, somewhat bitter. It contains about 3 per cent. of a light yellow, volatile oil, on which its properties depend.

THERAPEUTICAL EFFECTS.—An aromatic stimulant, sometimes used in the flatulent colic of children, and in the form of dill water as a vehicle for other remedies, chiefly purgatives, the griping properties of which it corrects.

DOSE AND MODE OF ADMINISTRATION.—Gr. x. to ʒi. of the bruised fruit for adults.—*Oleum Anethi*, E. (Prepared according to the general directions for the preparation of volatile oils). Dose, min. j. to min. v. rubbed up with sugar.—*Aqua Anethi*, L. E. (Dill, bruised, ℔iss. (ʒxviij., E.); proof (rectified, E.) spirit, fʒvij. (fʒiij., E.); water, cong. ij.; let a gallon distil). Dose, fʒss. to fʒiij.

ANGELICA, E. ANGELICA ARCHANGELICA, SEMINA, D. *Fruit (Root*, E.) *of Angelica archangelica.* Indigenous, but very rare; belonging to the Natural family *Umbelliferæ (Apiaceæ*, Lindley,) and to the Linnæan class and order *Pentandria Digynia.*

BOTANICAL CHARACTERS.—Biennial, 4–5 feet high; Stem, 1–2 inches thick, fistulose; Leaves, bipinnate; Flowers, greenish-white.

PROPERTIES.—The root is imported from Hamburgh; it consists of

numerous branches of the thickness of the little finger proceeding from a short spindle-shaped root-stalk, grayish-brown externally, whitish within. The odour is aromatic and agreeable; the taste warm, aromatic and pungent. The fruit, commonly called *angelica seed,* is oval, obtuse, 1-2 lines long, of a yellowish brown colour, flat, longitudinally striated on one side, convex on the other; it has the odour and taste of the root. The medicinal properties of both root and fruit depend on a volatile oil, which may be obtained by distillation, a peculiar crystalline acid has been also found to exist in it, which has been named *angelicic* acid. The root contains also bitter extractive, and a bitter resin.

*Adulterations.*—On the Continent an adulteration of angelica root with the root of the *Ligusticum levisticum* (Lovage), has been indicated; it may be readily detected by its yellow coloured pith when cut transversely, that of angelica root being white.

Therapeutical Effects.—An aromatic stimulant and carminative not much used. Dose of the *powdered root,* gr. x. to 3ss.; of the *bruised fruit,* 3ss. to 3i.

Anisum, L. E. Pimpinella anisum, semina, D. *Anise. Fruit of Pimpinella anisum.* A native of Egypt and the Levant, extensively cultivated in various parts of Europe; it belongs to the Natural family *Umbelliferæ (Apiaceæ,* Lindley), and to the Linnæan class and order *Pentandria Digynia.*

Botanical Characters.—Annual, about a foot high; Stem, smooth, erect, branching; Leaves of the stem, decompound; Flowers, small, white, in terminal umbels.

Properties.—The fruit, commonly called *aniseed,* is ovoid, composed of two mericarps, with five primary ridges, slightly hairy, of a yellowish-brown colour; it has a peculiar, sweet, aromatic odour, and a warm, sweetish taste. Its properties depend on a volatile oil, of which it contains 3 per cent; this oil is transparent and nearly colourless, having a slight greenish-yellow tinge; it congeals at 50° F., and does not become fluid again under 62°. It has the odour and taste of the fruit.

*Adulterations.*—The oil of star-anise *(Illicium anisatum),* which resembles oil of anise in odour and appearance, is often sold for it; the fraud is one of little consequence, but may be readily detected, as star-anise oil retains its fluidity at 35° F. The fruit of the hemlock has been confounded with *aniseed,* in consequence of which fatal accidents have in more than one instance occurred; they may be distinguished by the odour, and by the elevated ridges of anise fruit being smooth at the margin, not crenulate.

Therapeutical Effects.—Anise is an aromatic stimulant and carminative; and as such is employed in flatulent colic, and in the diarrhœa of infants and children. It is said to promote the secretion of milk in nurses. It is much used on the Continent to flavour liqueurs.

Dose and Mode of Administration.—Of the bruised fruit, gr. x. to ʒss.—*Oleum Anisi*, D. L. E. (Prepared according to the general directions for distilling volatile oils). This oil is generally imported from Germany and the East Indies. Dose, min. ij. to min. viij. rubbed up with sugar.—*Spiritus Anisi*, L. (Anise, bruised, ʒx.; proof spirit, cong. j.; water, Oij.; mix, and with a slow fire distil a gallon).—*Spiritus Anisi compositus*, D. (Aniseed, bruised; and angelica seeds, bruised, of each, ℔ss.; proof spirit, cong. j.; water, sufficient to prevent empyreuma; macerate for 24 hours, and distil a gallon). The dose of either of these preparations is from fʒss. to fʒj.

Armoracia. *Horse-radish* (described in the division *Sialogogues*), is sometimes used as a warm stimulant, chiefly as an adjunct to other medicines; it was formerly classed amongst the Antiscorbutics, but is little employed in the present day. The following are the officinal preparations:—*Infusum Armoraciæ compositum*, D. L. (Horse-radish root (fresh, D.), sliced; mustard, bruised, of each, ʒi.; compound spirit of horse-radish, fʒi.; boiling water, (distilled, L.), ℔i. (Oj., L.); macerate the root (and the seeds, L.) in water for 6 (2, L.) hours in a vessel lightly covered, and strain, then add the compound spirit of horse-radish). Dose, fʒi. to fʒij.—*Spiritus Armoraciæ compositus*, D. L. (Horse-radish root (fresh, D.), sliced; and dried orange peel, of each, ℔j. (ʒxx., L.); nutmegs, bruised, ʒss. (ʒv., L.); proof spirit, cong. j.; water, sufficient to prevent empyreuma (Oij., L.); mix (macerate for 24 hours, D.), and distil a gallon). Dose, fʒj. to fʒiv. Sliced horse-radish is a useful addition to the warm foot-bath to render it more stimulant.

Arnica montana, flores, folia et radix, D. *Leopard's-bane. Flowers, leaves and root of Arnica montana.* A native of the Alps, and of the Pyrennees; belonging to the Natural family *Compositæ* (*Asteraceæ*, Lindley,) and to the Linnæan class and order *Syngenesia Superflua*.

Botanical Characters.—Perennial, about a foot high; Stem, hairy, simple and single flowered, or compound and many flowered; Leaves, oval, entire; Flowers, golden-yellow.

Properties.—The whole plant has a strong, peculiar odour, and a herbaceous, acrid, somewhat bitter taste. The flowers and leaves are collected in July, and the roots in September. The flowers are principally used at present; they consist of resin, on which probably their active properties chiefly depend, a bitter acrid principle *(cytisin)*, yellow colouring matter, gum, and some salts. Weber has also obtained from them a small quantity of blue volatile oil. They yield their active principles to water, and to alcohol.

Therapeutical Effects.—Arnica bears a high character on the continent, particularly in Germany, as a stimulant in adynamic febrile

affections, in chronic rheumatism, in paralysis, in amaurosis, &c., but it is very rarely used in this country. I have seen a tincture of the flowers prove useful in nervous head-ache. Arnica is one of the most prominent articles in the Homeöpathic Materia Medica, possessing, according to the professors of that doctrine, the most wonderful therapeutic powers, being employed by them in the treatment of the most opposite diseases.

Dose and Mode of Administration.—Of the powder of the root, gr. x. three or four times a day. The flowers are usually given in the form of infusion or tincture.—*Infusum Arnicæ*, Aust. (Arnica flowers, ʒss.; boiling water, fʒxij.; infuse till cold, and strain). Dose, fʒij. to fʒss.—*Tinctura Arnicæ*, Pol. (Arnica flowers, ʒiss.; proof spirit, fʒxij.; digest for 7 days, express and strain). This tincture may be readily prepared by percolation, having previously macerated the flowers with a little of the spirit for 24 hours; or it may be prepared with the cut and bruised root, in the proportion of ʒij. of the root to Oj. of rectified spirit. Dose, fʒss. to fʒij.

Incompatibles.—The mineral acids; sulphate of iron; acetate of lead; and sulphate of zinc.

Balsamum tolutanum. *Balsam of Tolu* (described in the division *Expectorants)*, is an excellent stimulant in alopecia or baldness, it is best applied in the form of pomade as follows:—Prepared lard, ʒij.; white wax, ʒij.; melt together; remove from the fire, and when they are beginning to thicken, add with constant stirring, balsam of tolu, fʒij.; and oil of rosemary, min. xx.

Cajuputi, L. E. Melaleuca leucadendron, oleum volatile, D. *Oil of Cajeput. Volatile oil of the leaves of Melaleuca minor*, L. E.—*of Melaleuca leucadendron*, D. The tree from which this oil is obtained has been more recently named Melaleuca Cajuputi, it is a native of the Molucca Islands; and belongs to the Natural family *Myrtaceæ*, and to the Linnæan class and order *Polyadelphia Icosandria*.

Botanical Characters.—Trunk, about 20 feet high, crooked, with scattered branches; Leaves, smooth, deep green, 3-5 inches long; Flowers, white, in short terminal spikes.

Preparation.—The volatile oil is procured from the leaves by distillation; the leaves are gathered in the end of September, macerated for 24 hours with water, and then put into a copper still with sufficient water to prevent empyreuma. The oil comes over with the water into the receiver and floats on the surface.

Properties.—Cajeput-oil is limpid, very mobile, transparent, and of a fine pale bluish-green colour. It has a strong, agreeable odour, resembling a mixture of camphor, roses, and peppermint; the taste is warm and aromatic, leaving a sensation of coldness in the mouth. Its Sp. gr. is about ·925. It boils at 343°, and may be obtained nearly colourless by re-distillation. The composition of this oil is $C^{10}H^{9}O$; it is soluble in alcohol.

*Adulterations.*—In consequence of its high price, and the great demand for it while the cholera raged in the British isles, cajeput-oil was often counterfeited with oil of rosemary coloured and flavoured with camphor and cardamom seeds. The fraud was one difficult of detection, but at present it is met with in a very pure state. As imported, it sometimes contains copper, which may be recognised by its affording a reddish precipitate when agitated with a solution of ferrocyanide of potassium.

Therapeutical Effects.—Cajeput-oil is a powerful diffusible stimulant, at present not much used. When the Asiatic cholera first appeared, it was highly extolled as a remedy for that disease, but it did not retain its reputation long. It is much employed on the Continent in chronic rheumatism, gout, hysteria, and other nervous affections. Dose, min. v. to min. x. rubbed up with sugar. It also forms a useful external rubefacient, for which purpose ʒss. may be dissolved in fʒij. of rectified spirit.

Calamus aromaticus, E. Acorus, L. *Sweet Flag. Rhizome of Acorus calamus.* Indigenous; belonging to the Natural family *Acoraceæ (Orontiaceæ,* Lindley), and to the Linnæan class and order *Hexandria Monogynia.*

Botanical Characters.—Rhizome, creeping, with many long roots; Leaves, 2-3 feet high, bright green; Flowers, pale green, arranged upon a spadix.

Properties.—The rhizome or root-stalk, in the dried state as met with in the shops, is in flattened pieces from 3-5 inches long, and half an inch broad, with a corrugated, yellowish-brown, scaly cuticle; internally it is spongy, with a pinkish-yellow hue. It has a very agreeable aromatic odour, and a pungent bitter taste. Sweet flag-root is composed of soft resin, extractive, gum, inulin, a trace of volatile oil, some salts and woody fibre. It yields its properties to alcohol, and to water.

Therapeutical Effects.—An aromatic stimulant, scarcely ever employed. It may be used as an adjunct to tonics in debility of the digestive organs. Dose, in powder, gr. xx. to ʒi.; in infusion, (prepared by digesting ʒi. of the bruised rhizome in fʒxij. of boiling water for an hour), fʒi. to fʒij.

Incompatibles.—Acetate of lead.

Calx chlorinata, L. E. *Chloride of lime. Chlorinated lime. Hypochlorite of lime. Bleaching Powder.*

Preparation.—It is an article of the Materia Medica in the *Edinburgh Pharmacopœia;* and is usually prepared on the large scale for commercial purposes, by exposing hydrate of lime, from the purest lime, to chlorine gas, the latter being supplied so gradually as to prevent the heat occasioned by the combination from rising above 62°. The following process is given in the *London Pharmacopœia,*

for its preparation :—"Take of hydrate of lime, ℔j.; chlorine, a sufficiency; pass chlorine to the lime, spread in a proper vessel, until it is saturated. Chlorine is very readily evolved from Hydrochloric acid added to Binoxide of Manganese, with a gentle heat."

Physical Properties.—As commonly met with, this is a white or yellowish-white powder, with a faint odour of chlorine, and an acrid, disagreeable, persistent taste.

Chemical Properties.—Hypochlorite of lime is a mixture of 1 eq. of chloride of calcium, 1 of tribasic hypochlorite of lime, and 4 of water. Exposed to the air it deliquesces, evolves chlorine, and attracting carbonic acid, is converted into carbonate of lime, and chloride of calcium. It is partially soluble in water, a little hydrate of lime being left undissolved; the solution has a strong alkaline reaction, and bleaches vegetable colours, especially if an acid be added, so as to evolve the chlorine. Its best characteristics are its peculiar odour in solution, its bleaching properties, and the white precipitates it affords with solutions of nitrate of silver, of carbonates, and of oxalates.

*Adulterations.*—This compound frequently contains a very small quantity of chlorine, either from being originally badly prepared or from careless preservation; various processes have been described for *chlorometry;* but for medical purposes the tests for the purity of the powder as given in the *Edinburgh Pharmacopœia* are amply sufficient :—"Pale grayish-white; dry; gr. l. are nearly all soluble in f℥ij. of water, forming a solution of the density 1027; and of which 100 measures, treated with an excess of oxalic acid, give off much chlorine, and if then boiled and allowed to rest 24 hours, yield a precipitate which occupies 19 measures of the liquid."

Therapeutical Effects.—Hypochlorite of lime acts as a powerful stimulant, whether taken internally, or applied locally; it also possesses in a remarkable degree the property of destroying fetid effluvia, particularly when arising from the decay of animal matter, and of arresting or preventing the putrefactive process. In medicine it has been chiefly administered as an internal remedy in the advanced stages of typhoid fever, and in epidemic dysentery, being found particularly useful when the evacuations are very offensive. As a topical agent it is employed with benefit in the form of lotion to foul or gangrenous ulcers with excessive discharge, extensive burns or scalds, in purulent ophthalmia, in chronic cutaneous diseases, particularly scabies which it seldom fails to cure speedily and effectually, and as an injection in diseases of the rectum, the uterus, or vagina when accompanied with fetid discharges. In excessive mercurial salivation a gargle of one part of hypochlorite of lime dissolved in 100 parts of water will be found very effectual both in correcting the fetor, and checking the excessive secretion. This substance has been employed as a disinfectant, to prevent the spreading of epidemic diseases, and to destroy infection or contagion, but much doubts have been recently thrown on its disinfecting properties. It is also used for the purpose of destroying noxious effluvia arising from the decay of animal or vegetable matter, but for this purpose it is inferior to *Solution of chlorinated soda.*

Dose and Mode of Administration.—Internally, gr. ij. to gr. v. dissolved in water and sweetened with sugar, or in some aromatic distilled water. For external use solutions of various strengths are employed; in purulent ophthalmia, ℥ss. to ℥ij. in f℥i. of water; for cutaneous diseases, ℥iij. to Oj. of water; for a lotion or injection, gr. xx. to gr. xxx. in f℥i. of water. Solutions of this substance should be always filtered to remove the insoluble hydrate of lime, and kept in well stoppered bottles to prevent the escape of the chlorine. When it is desired to disengage the chlorine rapidly from hypochlorite of lime, any weak acid may be added to the solution.

Incompatibles.—Sulphuric acid, and its salts; the alkalies; and all soluble carbonates, and oxalates.

Camphora, D. L. E. *Camphor. Camphor of Laurus camphora, and of Dryobalanops camphora,* D.—*A peculiar concretion purified by sublimation, from Laurus camphora,* L.—*Camphor of Camphora officinarum,* E. The Edinburgh College has adopted the botanical nomenclature of Nees von Esenbeck with reference to the Camphor-tree; it is a native of China and Japan; and belongs to the Natural family *Lauraceæ,* and to the Linnæan class and order *Enneandria Monogynia.* The camphor obtained from the Dryobalanops camphora, a native of Borneo and Sumatra, belonging to the Natural family *Dipteraceæ,* is not brought to Europe.

Botanical Characters.—A handsome tree with a straight trunk, branching at the top; Leaves, oval, pointed, shining, evergreen, emitting a strong odour of camphor when bruised; Flowers, small, whitish, in axillary and terminal panicles; Fruit, a small rounded, fleshy drupe, with an acrid, aromatic taste.

Preparation.—Camphor is procured from the small branches, the leaves, the wood, and the root of the tree, which are cut into small pieces, and boiled with water in an iron cucurbit, to which an earthen capital is luted; the camphor sublimes, and is condensed on straws placed in the capital. In this coarse state it is imported into Europe, when it is purified by being sublimed in glass vessels, quick lime having been previously mixed with the crude camphor to retain the impurities. Borneo camphor is found in a concrete state in cavities and fissures in the heart of the tree.

Physical Properties.—Refined camphor is met with in hemispherical masses, perforated in the centre; it is white, translucent, shining, fragile, with a crystalline fracture, nevertheless tough and pulverized with great difficulty, unless with the aid of a little rectified spirit. It is lighter than water, its density being 0·9857. It has a peculiar aromatic smell, and a bitter cooling taste.

Chemical Properties.—Camphor is a species of solid volatile oil; it is composed of 1 eq. of *camphogen* ($C^{20}H^{14}$) and 2 of water (Dumas). It evaporates at the ordinary temperature of the air, forming minute crystalline masses on the sides of the bottles in which it is kept; in close vessels it fuses at 347°, and boils at 399°, condensing unchanged. It requires 1000 parts of water for its solution, to which, however, it

imparts both odour and taste; but it may be suspended in large quantity in water by means of mucilage, sugar, yolk of egg, &c. It is very soluble in alcohol, ether and the fixed and volatile oils. The solution in alcohol is precipitated by water. Milk dissolves an eighth of its weight of camphor, which it retains on the addition of water.

*Adulterations.*—Camphor is met with of great purity in this country, but it is frequently adulterated on the Continent with muriate of ammonia. The sophistication may be readily detected by rubbing a suspected specimen in a mortar with a little quicklime, which liberates the ammonia; or by treating it with water, which dissolves out the muriate of ammonia.

Therapeutical Effects.—Much difference of opinion exists as to the action of camphor on the animal economy, but the most constant and most marked effect which it produces is that of a general diffusible stimulant; and this is borne out by the symptoms which are caused by it when taken in an over-dose—viz., great dyspnœa, violent palpitation of the heart, and continued vomiting. In the practice of medicine it has been used in a great variety of diseases, in consequence of the discrepancy which even still exists as to its effects; but the following are the principal maladies in which it proves decidedly beneficial. In the advanced stages of typhoid fever, when nervous symptoms as subsultus tendinum, delirium, &c., chiefly predominate. In chronic bronchitis occurring in broken down habits, particularly when accompanied by profuse secretion; in spasmodic and nervous diseases, provided there is no inflammatory tendency in the system; in atonic gout, and chronic rheumatism; and in irritable and painful diseases of the urinary organs. As an external application camphor is very generally employed, dissolved in spirit or in oil, as an embrocation for muscular and rheumatic pains, for bruises, to glandular enlargements, and to chilblains. It is also used with much benefit as a stimulant to foul and indolent ulcers, and to gangrenous sores occurring in the old and debilitated. Made into an ointment with prepared lard, it has been recently employed on the Continent, and it is stated with much success, in the treatment of chronic cutaneous diseases, particularly in those forms accompanied by much itching, which troublesome symptom it appears speedily to allay. Camphor has been occasionally used in the form of vapour to promote diaphoresis when the skin is dry and harsh, and in old cutaneous affections.

Dose and Mode of Administration.—Gr. v. to gr. x. repeated at short intervals; it is usually given in the form of pill, or made into an emulsion with water by means of mucilage, sugar, yolk of egg, &c.; ʒij. of camphor may be permanently suspended in fʒviij. of water by means of ʒi. of thick mucilage, or it may be dissolved in new milk as observed above.—*Mistura Camphoræ*, D. L. E. ("Camphor, ϑi.; rectified spirit, gtt. x.; pure sugar, ʒss.; warm water, *by measure* Ibj.; first rub the camphor with the spirit, then with the sugar, afterwards add the water with trituration, and filter the mixture through bibulous paper," D.—"Camphor, ʒss.; rectified spirit, min. x.; water, Oi.; first rub the camphor with the spirit, then with the water gradually poured in, and strain through linen," L.—"Camphor, ϑj.; sweet

almonds and pure sugar, of each, ℥ss.; water, Oj.; steep the almonds in hot water, and peel them; rub the camphor and the sugar well together in a mortar; add the almonds; beat the whole into a smooth pulp; add the water gradually with constant stirring, and strain," E.). *Camphor julep.* This preparation contains so small a quantity of camphor, that it is only used as a vehicle for more active stimulants; Dose, f℥i. to f℥ij.—*Mistura Camphoræ cum Magnesiâ,* D. E. (Camphor, gr. xij. (gr. x., E.); carbonate of magnesia, ℥ss. (gr. xxv., E.); water, f℥vj.; rub the camphor with the magnesia, adding the water gradually, and mix). The carbonate of magnesia enables the water to dissolve more of the camphor, and also gives to the mixture slight antacid properties; Dose, f℥ss. to f℥i.—*Aqua Camphoræ,* U. S. (Camphor, ℥ij.; alcohol, min. xl.; carbonate of magnesia, ℥i.; distilled water, Oij.). One fluid ounce contains gr. iij. of camphor; Dose, f℥ss. to f℥iss.—*Tinctura Camphoræ,* D. L. E. (Camphor, ℥i. (℥v., L. ℥iiss., E.); rectified spirit, f℥viij. (Oij., L. E.); mix, that the camphor may be dissolved). *Camphorated spirit;* for external use only; an excellent application for muscular and rheumatic pains, applied with friction. The camphor is precipitated by the addition of water.—*Essence of Camphor,* (Tincture of myrrh, f℥ss.; tincture of camphor, f℥iss.; rectified spirit, f℥iv.; mix). The tincture of myrrh renders this preparation miscible, with water. About min. l. will make a pint of ordinary camphor julep.—*Oleum Camphoratum,* D. *Linimentum Camphoræ,* L. E. (Camphor, ℥j. (℥i., L. E.); olive oil ℥j. (f℥iv., L. E.); dissolve the camphor in the oil by trituration). A stimulating embrocation for deep-seated inflammation, glandular swellings, &c.—*Linimentum Saponis,* D. L. E. ("Soap, ℥iij.; camphor, ℥j.; spirit of rosemary, f℥xvj.; [digest the soap in the spirit till it is dissolved, then add the camphor, D.] [Dissolve the camphor in the spirit; afterwards add the soap, and macerate with a gentle heat till it is dissolved, L.]," D. L.—"Castile soap, ℥v.; camphor, ℥iiss.; oil of rosemary, f℥vj.; rectified spirit, Oij.; digest the soap in the spirit for 3 days; add the camphor and oil, and agitate briskly," E.). *Soap Liniment; Opodeldoc.* A useful stimulating liniment.—*Camphor Ointment.* (Prepared lard, ℥i.; camphor, reduced to fine powder, ℥ss.; mix intimately).

Incompatibles.—The following observations of M. Planche, should be borne in mind in prescribing camphor:—With benzoïn, balsam of tolu, ammoniac, and mastich, it forms a soft mass which does not retain the pilular form; camphor is completely deprived of odour by being mixed with assafœtida, galbanum, sagapenum, and balsam of tolu; and the odour is very much weakened by olibanum, mastich, ammoniac, opoponax, benzoïn, and resin of guaiacum.

Capsicum. *Cayenne Pepper* (described in the division *Epispastics*), is not much employed in medicine internally; it is a good stimulant in those forms of dyspepsia which depend on enfeebled and languid digestion, and in the collapse of cholera and of typhus. As a topical remedy it is used with much benefit as an adjunct to stimulating gargles in cynanche maligna, and in all forms of relaxed sore throat. For this

purpose either the tincture or *Chili vinegar* is generally employed. The dose of powdered capsicum is from gr. ij. to gr. viij., made into pill with crumb of bread.—*Tinctura Capsici*, D. L. E. (Capsicum (bruised, L. E.), ʒi. (ʒx., L. E.); proof spirit, ℔ij. (Oij., L. E.); macerate (digest, E.) for 14 (7, E.) days and filter, "squeezing the residuum. This tincture is best prepared by percolation, which may be commenced so soon as the capsicum is made into a pulp with a little spirit," E.). Dose, *internally*, min. xx. to fʒi.; as an adjunct to gargles, fʒiv. to fʒvj. in fʒviij. of an aqueous vehicle.—*Chili Vinegar* (Prepared by infusing ʒss. of cayenne pepper in Oij. of white wine vinegar, for 10 days, and straining), is added to gargles in the proportion of fʒi. in fʒviij. of infusion of roses.—*Cayenne Lozenges* allowed to dissolve slowly in the mouth are very useful in the hoarseness and relaxed sore throat of public speakers and singers.

Incompatibles.—Ammonia; alkaline carbonates; sulphates; acetate of lead; nitrate of silver; and corrosive sublimate.

Cardamine, L. Cardamine pratensis, flores, D. *Cuckoo-flower. The flowers of Cardamine pratensis.* Indigenous; belonging to the Natural family *Cruciferæ (Brassicaceæ*, Lindley), and to the Linnæan class and order *Tetradynamia Siliquosa.*

The flowers of this plant are blush-coloured; they have a slight aromatic odour, and a pungent, bitter taste. Their virtues depend on a trace of volatile oil, and some bitter extractive which they contain; though at one time highly spoken of as stimulants in epilepsy and in spasmodic asthma, they have completely fallen into disuse. The dose of the dried flowers, was from ʒij. to ʒiij. several times a day.

Cardamomum, L. E. Amomum cardamomum, semina, D. *Cardamoms. The seeds of Amomum cardamomum*, D. *Seeds of Alpinia cardamomum*, L. *Fruit of Renealmia cardamomum*, E. *Fruit of Elettaria cardamomum*, Maton. The various sorts of cardamoms met with in commerce are obtained from the plants above enumerated, or from nearly allied species; but the true officinal or *lesser* cardamom is the product of that last named. It is a native of Malabar; and belongs to the Natural family *Zingiberaceæ*, and to the Linnæan class and order *Monandria Monogynia.*

Botanical Characters.—Stem, erect, 6-9 feet high, perennial; Leaves, 1-2 feet long, enveloping the stem with their spongy sheaths; Scapes, several, arising from the base of the stem, 1-2 feet long; Flowers, alternate, on sub-erect racemes, 2-3 inches long, greenish-white with violet stripes; Capsule, oval, 3-celled.

Physical Properties.—Cardamoms are the dried fruit, they are gathered in November; as met with in commerce, each fruit is ovato-oblong, obscurely triangular, from three lines to an inch in length, of a pale brownish-yellow colour, coriaceous. They contain numerous, angular,

reddish-brown seeds. They have an agreeable aromatic odour, and a grateful pungent taste.

Chemical Properties.—Cardamoms are composed of volatile oil, fixed oil, fecula, colouring matter, mucilage, and nitrogenous matter; they yield their active principles to water and to alcohol. A cooled decoction is rendered blue by tincture of iodine.

Therapeutical Effects.—Cardamoms are amongst the most agreeable of the aromatic stimulants, and are commonly employed as adjuvants to more active medicines of this class, or to correct the griping properties of some purgatives.

Dose and Mode of Administration.—In powder, gr. v. to gr. xx.—*Tinctura Cardamomi*, L. E. (Cardamom seeds, bruised, ℥iiiss. (℥ivss., E.); proof spirit, Oij.; "macerate for 14 days and strain," L.—"Digest for 7 days, strain, squeeze the residuum and filter the liquors. This tincture may be better prepared by the process of percolation in the same way with the tincture of capsicum, the seeds being first ground in a coffee mill," E.). An aromatic adjunct to mixtures in doses of f℥i. or f℥ij.—*Tinctura Cardamomi composita*, D. L. E. ("Cardamom seeds, without the capsules and bruised; and caraway seeds, bruised, of each, ℥ij.; cinnamon bruised, ℥ss.; proof spirit, *by measure* ℔ij.; macerate for 14 days and filter," D.—"Cardamom seeds, bruised; and caraway, bruised, of each, ℥iiss.; cochineal, powdered (bruised, E.) ℥j.; cinnamon, bruised, ℥v.; raisins, ℥v.; proof spirit, Oij.; macerate for 14 (7, E.) days and strain, [express strongly the residuum and filter the liquors. This tincture may be also prepared by the method of percolation, if the solid materials be first beat together, moistened with a little spirit, and left thus for 12 hours before being put into the percolator, E.]" L. E.). Dose, f℥j. to f℥ij.

Incompatibles.—Acids; sulphate of iron; and corrosive sublimate.

Carui, L. E. Carum carui, semina, D. *Caraway. The fruit (Seeds, D.) of Carum carui.* Indigenous; belonging to the Natural family *Umbelliferæ (Apiaceæ*, Lindley), and to the Linnæan class and order *Pentandria Digynia.*

Botanical Characters.—Biennial; Stem, 1-2 feet high; Leaves, doubly pinnated, cut into linear segments; Flowers, white, or pale flesh-coloured, in dense umbels.

Properties.—The fruit, commonly called *caraway-seeds* does not require description; it has an agreeable fragrant odour, and a warm aromatic taste. It contains about 5½ per cent of a light yellow volatile oil, upon which its aromatic properties depend.

Therapeutical Effects.—Caraway is an agreeable aromatic stimulant, much employed by the cook and confectioner as a seasoning and flavouring agent. In medicine it is used for giving warmth to other preparations.

Dose and Mode of Administration.—Of the seeds, ℥i. to ℥ij.—*Oleum Carui*, D. L. E. (Prepared according to the general directions

for distilling volatile oils). Frequently added to cathartic pills and boluses; Dose, min. j. to min. x. This oil is often adulterated with oil of turpentine, which may be detected by the odour when dropped on a heated spatula.—*Aqua Carui,* D. L. ("Caraway, bruised, ℔j.; water, sufficient to prevent empyreuma; distil a gallon," D. "Caraway, bruised, ℔iss.; proof spirit, f℥vij.; water, cong. ij.; distil a gallon," L.). Used as an aromatic vehicle for other medicines, and in the flatulent colic of children; Dose, f℥i. to f℥iv.—*Spiritus Carui,* D. L. E. ("Caraway, bruised, ℔j.; proof spirit, cong. j.; water, sufficient to prevent empyreuma; macerate for 24 hours and distil a gallon," D.—"Caraway, bruised, ℥xxij.; proof spirit, cong. j.; water, Oij.; mix, and with a slow fire distil a gallon," L.—"Caraway, bruised, ℔ss.; proof spirit, Ovij.; macerate for two days in a covered vessel, add Oiss. of water, and distil off Ovij," E.). Aromatic and stimulant; Dose, f℥i. to f℥iv.

Caryophyllus; Caryophylli oleum, L. E. Eugenia caryophyllata, flores nondum expliciti et oleum volatile, D. *Cloves, and their volatile oil. Dried undeveloped flower (dried buds,* L.*), and the volatile oil distilled from them (distilled from the flowers,* L.*), of Caryophyllus aromaticus,* L. E.—*of Eugenia caryophyllata,* D. The same tree is indicated by all the Colleges, but the Dublin has adopted the nomenclature of Thunberg. It is a native of the Molucca Islands, and grows freely in various parts of the East and West Indies. It belongs to the Natural family *Myrtaceæ,* and to the Linnæan class and order *Polyandria Monogynia.*

Botanical Characters.—Stem, 15-30 feet high; Leaves, opposite, coriaceous, dotted, obovato-oblong; Flowers, whitish, numerous, in terminal or axillary cymes.

Properties.—Cloves are the undeveloped flowers, consisting of the tubular calyx with the unexpanded corolla, forming a small round ball between its four teeth. Their odour is peculiar, agreeably aromatic, and their taste pungent, somewhat acrid. They consist of 18 per cent of volatile oil, 6 of an almost tasteless resin *(Caryophyllin),* 13 of tannin, 4 of extractive, 13 of gum, 28 of lignin, and 18 of moisture, (Tromsdorff). The volatile oil is an article of the Materia Medica in the British Pharmacopœias. As obtained by distillation it consists of two volatile oils, one heavier, the other lighter than water, a mixture of the two forming oil of cloves of commerce. It is at first pale yellow, but gradually acquires a reddish tint; it has the odour and taste of cloves in a marked degree; it is very soluble in alcohol, ether, strong acetic acid and the fixed oils; and but very sparingly soluble in water, in which it sinks, its density being about 1·060. Cloves yield their properties to water and to alcohol.

*Adulterations.*—Cloves from which the oil has been procured by distillation are sometimes mixed with good cloves; they may be distinguished by their lightness, and by their not becoming greasy when bruised with

the nail. The oil is sometimes adulterated with oil of turpentine, which may be detected by the odour when it is dropped on a heated spatula.

Therapeutical Effects.—Cloves and their oil are aromatic stimulants, and are employed in medicine as flavouring or corrective adjuncts to other substances; they are extensively used by the cook and confectioner. The oil dropped into the hollow of a carious tooth will often relieve tooth-ache.

Dose and Mode of Administration.—In substance, gr. x. to ʒss.—*Oleum Caryophylli*, min. ij. to min. viij.—*Infusum Caryophyllorum*, D. *Infusum Caryophylli*, L. E. (Cloves, bruised, ʒi. (ʒiij. L. E.); boiling water (distilled L.), *by measure* ℔ss. (Oj. L. E.); digest (macerate, L. infuse, E.) for two hours in a covered vessel, and strain). An aromatic vehicle for more active medicines. Dose, fʒi. to fʒij.

Incompatibles.—*With the infusion.* The mineral acids; lime water; sesqui-salts of iron; sulphate of copper; nitrate of silver; acetate of lead; tartar emetic; and gelatine.

Cassiæ cortex et oleum, E. Laurus cassia, cortex, D. *Cassia-bark. Oil of Cassia. Bark (and volatile oil of the bark,* E.) *of Cinnamomum cassia,* E.—*of Laurus cassia,* D. The bark met with in English commerce, is procured from the *Cinnamomum aromaticum* (Nees), indicated by the Edinburgh College. It is a native of China, and is cultivated in Java; it belongs to the Natural family *Lauraceæ*, and to the Linnæan class and order *Enneandria Monogynia*.

Botanical Characters.—Stem, arborescent, about 50 feet high; Leaves, oblongo-lanceolate, triple-nerved, the nerves vanishing at the point of the leaf; Petioles, and younger branches, silky-tomentose; Flowers, white, in panicles.

Physical Properties.—No account has been given of how cassia is prepared, but it is more than probable that it is by a process similar to that by which cinnamon is procured. It is imported from Singapore in bundles tied with slips of the bamboo cane; it resembles cinnamon in appearance, and is often sold for it, but it is darker coloured, much thicker, and in simple quills. The odour is not so fragrant as that of cinnamon, and the taste is more pungent and somewhat bitter.

Chemical Properties.—Cassia bark consists of 0·8 per cent of volatile oil, 4 of resin, 14·6 of extractive, with woody fibre, &c.; the volatile oil is always imported, it is of a wine-yellow colour, and has the odour and flavour of the bark; it is heavier than water, its density being 1·095. Cassia bark yields its active properties to alcohol, but only partially to water. The undeveloped flowers of *Cinnamomum aromaticum* are imported under the name of Cassia buds *(Clavelli Cinnamomi)*. They have the same properties as the bark, but are not employed in medicine.

Therapeutical Effects.—Cassia and its preparations are precisely analogous in their operation to cinnamon, for which, as being much cheaper, they are usually substituted; their odour and taste perhaps is not quite so agreeable, and some have held them to be more astringent.

Dose and Mode of Administration.—Of the bark, powdered, gr. x. to ʒss.—*Oleum Cassiæ*, E., min. ij. to min. v.—*Aqua Cassiæ*, E. (Cassia bark, bruised, ʒxviij.; water, cong. ij.; rectified spirit, fʒiij.; mix together and distil off one gallon). An aromatic vehicle for more active medicines; Dose, fʒi. to fʒiv.—*Spiritus Cassiæ*, E. (Cassia bark in coarse powder, ℔j.; proceed as for spirit of caraway). Dose, fʒss. to fʒi.—*Tinctura Cassiæ*, E. (Cassia bark, in moderately fine powder, ʒiij. ʒiij.; proof spirit, Oij.; digest for 7 days, strain, express the residuum strongly and filter. This tincture is more conveniently made by percolation, the cassia being allowed to macerate for 12 hours in a little of the spirit before being put into the percolator). Dose, fʒi. to fʒij.

Incompatibles.—The sesqui-salts of iron, and gelatine.

Cepa. Allium cepa, bulbus, D. *The Onion. Bulb of Allium cepa.* A native of Egypt; belonging to the Natural family *Liliaceæ*, and to the Linnæan class and order *Hexandria Monogynia.*

Roasted onions were at one time employed in the form of poultice to stimulate indolent tumors, and as an application to foul ulcers; but they are not used in medicine in the present day.

Cerevisiæ fermentum, D. L. *Yeast. Barm. A vegetable product developed in vinous liquids during the process of fermentation.* Yeast is employed as a stimulant in the advanced stages of typhoid fevers, and in the form of enema in tympanitis, and has been highly spoken of in cases where wine is inadmissible in consequence of inflammatory symptoms. Its principal use at present is for the preparation of a stimulating cataplasm for foul and irritable sores, the fetor of which it corrects, and at the same time promotes the separation of the sloughs. It has been used on the continent with great benefit, as an application to recent bruises; it is simply spread on lint, and the injured parts covered with it; the sooner it is applied after the accident, the more prompt and certain are its effects. —*Cataplasma Fermenti*, D. L. (Yeast, ℔ss. (Oss. L.); wheaten flour, ℔j.; mix, and apply a gentle heat until they begin to rise). This cataplasm should be renewed every six or eight hours; if it occasion much pain, the quantity of flour ought to be increased. The dose of yeast for internal use is two table-spoonsful every three hours, it may be given with camphor mixture or with peppermint water.

Chlorinii aqua, D. Chlorinei aqua, E. *Chlorine water. Concentrated watery solution of Chlorine (with a little sulphate of soda,* E ).

Preparation.—*Dub.*—"Dried muriate of soda, 100 parts; oxide of manganese, 30 parts; sulphuric acid, 87 parts; water, 124 parts; add the acid gradually to the water; and when the mixture has grown cold, pour it on the muriate of soda and oxide of manganese, both previously reduced to fine powder, well mixed, and put into a retort; then with a proper apparatus, and a moderate heat gradually increased, transmit the gas escaping from the mixture,

through 200 parts of distilled water, the operation being finished as soon as the effervescence in the retort has ceased. Let the chlorine water be kept in well stopped bottles in a dark place." *Edin.*—" Muriate of soda, gr. lx. ; sulphuric acid (commercial), f℥ij. ; red oxide of lead, 350 grains; water, f℥viij. ; triturate the muriate of soda and oxide together; put them into the water contained in a bottle with a glass stopper ; add the acid, agitate occasionally till the red oxide becomes almost white. Allow the insoluble matter to subside before using the liquid."

Physical Properties.—Prepared according to the directions of the Dublin Pharmacopœia, this is a yellowish-green liquid, with the suffocating odour of chlorine, and an acrid styptic taste; its density is 1·013.

Chemical Properties.—This solution contains about twice its bulk of chlorine gas; it bleaches all vegetable colours. By long keeping, particularly if exposed to light, it is converted into a weak solution of muriatic acid, and oxygen is evolved: in consequence of these disadvantages, the Edinburgh Pharmacopœia contains a formula, given above, by which an aqueous solution of chlorine may be obtained in a few hours. It contains a small quantity of sulphate of soda dissolved in it, which, however, can in no wise interfere with its medicinal employment; and a white sulphate of lead remains as an insoluble precipitate in the bottom of the bottle. Chlorine water is characterised by its bleaching properties, by its power of dissolving leaf gold, and by its not effervescing with carbonate of lime.

Therapeutical Effects.—Taken in large quantity, chlorine water acts as a powerful irritant poison. In medicinal doses it operates as a stimulant, and as such is employed with benefit in the advanced stages of typhoid fevers and of epidemic dysentery, in malignant sore throat, and in chronic diseases of the liver. Chlorine gas diluted with common air has been inhaled in chronic bronchitis and in phthisis, but although the symptoms are often ameliorated under its employment, the benefit produced is not permanent. Externally, chlorine water has been used largely diluted as a wash to foul and indolent ulcers and for chronic cutaneous diseases, in the form of gargle in cynanche maligna, and as a local bath in hepatitis.

Dose and Mode of Administration.—f℥ss. to f℥ij. in as many ounces of water sweetened with syrup. For external use, f℥i. may be diluted with f℥j. of water.

Incompatibles.—Nitrate of silver; and the acetates of lead.

In poisoning with chlorine water, the best antidote is albumen, as white of egg, or in its absence, milk or flour.

Cinnamomum, L. E. Cinnamomi oleum, L. E. Laurus cinnamomum, cortex et oleum volatile, D. *Cinnamon. Oil of Cinnamon. Bark, and volatile oil of Laurus cinnamomum,* D. L.—*of Cinnamomum zeylanicum,* E. The cinnamon tree is a native of Ceylon and Malabar; it belongs to the Natural family *Lauraceæ,* and to the Linnæan class and order *Enneandria Monogynia.*

Botanical Characters.—Stem, arborescent, about 30 feet high ; Branches, obscurely 4-cornered; Leaves, tapering into a blunt point, 3-nerved, smooth,

and perfectly free from down, as also are the leaf stalks; Flowers, in terminal and axillary stalked panicles.

Preparation.—The inner bark of the branches, and the volatile oil obtained from it are used in medicine. The bark is taken from branches which are three years old, they are lopped off the trees in the rainy season, and the bark immediately removed by making two opposite longitudinal incisions; the epidermis and green pulpy matter are afterwards scraped off, the smaller pieces introduced into the larger ones, and dried in the sun, the pieces contracting as they dry into the form of quills. The oil is obtained by macerating the coarser pieces of bark and the trimmings in sea water for 48 hours, and submitting them to distillation.

Physical Properties.—Cinnamon is imported from Ceylon in bales and in boxes, some is also brought from Malabar. Three sorts are usually distinguished in commerce; the finest is in splintery rolls consisting of compound quills, the smaller being inclosed within the larger, from 30 to 40 inches in length; the pieces are very thin, generally not much thicker than writing paper, of a light brownish-yellow colour, smooth on the surface, with a splintery fracture. The odour is aromatic and fragrant, and the taste warm, sweetish, and feebly astringent. The inferior kinds are in coarser quills, not so much rolled, of a darker brown colour, and with a less agreeable odour and taste. Oil of cinnamon is imported from Ceylon; it is of a pale wine yellow colour, becoming darker by age, and possesses intensely the peculiar odour and taste of the bark; it is heavier than water, its density varying from 1·038 to 1·041 (Christison).

Chemical Properties.—Cinnamon bark consists of volatile oil, tannin, mucilaginous extractive, an acid, resin, colouring matter, and woody fibre. It yields its properties partially to water but more completely to alcohol. The volatile oil constitutes about 6 parts in a thousand of the fresh bark; it consists of a light and heavy oil which may be obtained separate by distillation. The composition of oil of cinnamon is $C^{20}H^{11}O^2$ (Mulder); by exposure to the air it absorbs oxygen, and is converted into a mixture of *cinnamic acid*, two peculiar resins and water. Strong nitric acid converts oil of cinnamon into a solid crystalline mass.

*Adulterations.*—Cinnamon bark may be distinguished by its physical properties from cassia bark which is often sold for it. The oil may be distinguished from oil of cassia by its more fragrant odour, and by the taste of the latter being more acrid and burning. The tests of the Edinburgh Pharmacopœia for the purity of oil of cinnamon apply equally to oil of cassia:—"Cherry-red when old; wine yellow when recent; odour purely cinnamonic; nitric acid converts it nearly into a uniform crystalline mass."

Therapeutical Effects.—Cinnamon is an excellent warm stimulant, and in consequence of its agreeable flavour is very much employed in medicine, principally as an aromatic adjunct to other substances. It is also very commonly used as a vehicle for more active medicines. The oil is not much employed, but it forms an excellent addition to cathartic pill masses.

Dose and Mode of Administration.—In powder, gr. x. to ʒss.—*Oleum Cinnamomi*, D. L. E., min. j. to min. v.—*Aqua Cinnamomi*, D.L. E. ("Cinnamon bruised, ℔j.; water sufficient to prevent empyreuma; macerate

for a day and distil a gallon," D.—"Cinnamon, bruised, ℔iss. (or oil of cinnamon, ʒij.); proof spirit, fʒvij.; water, cong. ij.; distil a gallon," L.—"Cinnamon, bruised, ʒxviij.; water, cong. ij.; rectified spirit, fʒiij.; mix and distil off one gallon," E.). An agreeable vehicle for other medicines; Dose, fʒi. to fʒiv.—*Spiritus Cinnamomi*, D. L. E. ("Cinnamon, bruised, ℔j.; proof spirit, cong. j.; water, sufficient to prevent empyreuma; macerate for 24 hours and distil a gallon," D.—"Oil of cinnamon, ʒij.; proof spirit, cong. j.; water, Oi.; mix, and with a slow fire distil a gallon," L.—"Cinnamon, in coarse powder, ℔i.; proceed as for spirit of caraway," E.) Dose, fʒi. to fʒss.—*Tinctura Cinnamomi*, D. L. E. ("Cinnamon, bruised, ʒiiiss.; proof spirit, *by measure*, ℔ij. (Oij. L.); macerate for 14 days and strain," D. L.—"Cinnamon, in moderately fine powder, ʒiiiss.; proof spirit, Oij.; proceed by percolation or digestion as directed for tincture of cassia," E.). Dose, fʒi. to fʒss.—*Tinctura Cinnamomi composita*. L. E. ("Cinnamon, bruised, ʒi.; cardamom, bruised, ʒss.; long pepper, powdered; and ginger, sliced, of each, ʒiiss.; proof spirit, Oij.; macerate for 14 days and strain," L.—"Cinnamon, in coarse powder (fine, if percolation be followed); and cardamom seeds, bruised, of each, ʒi.; long pepper, ground finely, ʒiij.; proof spirit, Oij. This tincture is best prepared by percolation as directed for the compound tincture of cardamom; but it may also be made by digestion for 7 days, straining and expressing the liquor, and then filtering it," E.). Dose, fʒi. to fʒij.—*Confectio Aromatica*, D. L. (Cinnamon; and nutmegs, of each, ʒij.; cloves, ʒi.; cardamom seeds, ʒss.; saffron, ʒij.; prepared chalk, ʒxvj.; pure sugar, ℔ij.; "rub the dry ingredients together to a very fine powder, add ℔i. of water by degrees, and beat into a pulp," D.—"Keep in a close vessel, and whenever the confection is to be used, add water gradually, and mix until they are thoroughly incorporated," L.). Stimulant, carminative and antacid, frequently used in mild cases of diarrhœa. Dose, gr. xx. to ʒj.; substances incompatible with chalk should not be prescribed in combination with it.—*Pulvis Aromaticus*, D. E. *Pulvis Cinnamomi compositus*, L. ("Cinnamon, ʒij.; cardamom seeds, ʒi. (ʒiss. L.); ginger, ʒi.; long pepper, ʒi. (ʒss, L.); rub together to a very fine powder," D. L.—"Cinnamon; cardamom seeds; and ginger, of each, equal parts; reduce to a very fine powder, and keep in well closed glass vessels," E.). Dose, gr. v. to gr. xx.—*Electuarium Aromaticum*, E. (Aromatic powder, one part; syrup of orange peel, two parts; mix, and triturate into a uniform pulp). Dose, gr. x. to gr. xl.—*Emplastrum Aromaticum*, D. (Frankincense, ʒiij.; yellow wax, ʒss; cinnamon powdered, ʒvj.; oil of pimento; and oil of lemons, of each, ʒij.; melt the frankincense and wax together, and strain; and when they are beginning to thicken by cooling, mix in the cinnamon powder, rubbed up with the oils, and make a plaster). A stimulating plaster applied over the region of the stomach in nausea and flatulence; not much used at present.

Incompatibles.—The sesqui-salts of iron, and gelatine.

Cocculus, E. Cocculus suberosus, fructus, D. *Cocculus Indicus. Fruit of Anamirta cocculus,* E.—*of Cocculus suberosus,* D. A native of Malabar and the eastern islands of India; belonging to the Natural family *Menispermaceæ,* and to the Linnæan class and order *Diœcia Monadelphia.*

Botanical Characters.—A strong climbing shrub; Bark, corky, ash-coloured, cracked; Leaves, roundish, leathery, smooth, 6 inches long, and as many broad; Flowers, in lateral compound racemes; Drupes, 2-3, globose.

Physical Properties.—The fruit commonly known under the name of Cocculus Indicus, is roundish, about the size of a large pea, with a dark brown wrinkled perisperm, within which is the bivalved, one-celled fruit; the kernel is white and oily, and does not completely fill the shell. It is void of odour, but has an intensely bitter taste.

Chemical Properties.—The nucleus contains a peculiar, white, crystalline acid which has been named *Picrotoxin,* resin, gum, a fatty acid, and other unimportant substances; the pericarp contains another peculiar principle which has been named *Menispermin,* and which possesses properties very nearly similar to those of Picrotoxin which is the active principle of the drug; the latter is soluble in 150 parts of temterate water, 25 of boiling water, 2 of pure ether, and 3 of alcohol; it is insoluble in the fixed and volatile oils; its composition is $C^{12}H^{7}O^{5}$. Cocculus Indicus yields its active properties to alcohol, and but very imperfectly to either cold or boiling water.

*Adulterations.*—As met with in commerce either from having been gathered before it is quite ripe or from long keeping, the kernel is often completely dried up, so as to leave the shell nearly if not quite empty. The *Edinburgh College,* therefore directs, "that the kernels should fill at least two-thirds of the fruit."

Therapeutical Effects.—Cocculus Indicus is a powerful stimulant, in large doses producing death with tetanic convulsions and coma. It is used in India to poison fish; and in this country is often nefariously employed by brewers to give an artificial strength to beer. In medicine it is only employed externally to destroy vermin, and as a stimulating application in the form of ointment to furfuraceous eczema and porrigo of the scalp. Picrotoxin is highly poisonous, it may be used as a substitute for the drug.

Pharmaceutical Preparations.—*Unguentum Cocculi,* E. (Take any convenient quantity of Cocculus Indicus, separate and preserve the kernels, beat them well in a mortar, first alone, and then with a little axunge; and then add axunge till it amounts altogether to five times the weight of the kernels).—*Unguentum Picrotoxin,* Jager. (Picrotoxin, gr. x.; axunge, ℥i.; mix intimately). Either of these ointments may be applied in small quantities to the scalp night and morning in the cases above mentioned, and the head well cleansed with soap and warm water at least once daily. They should be used with great caution when the skin is not entire, as danger may arise from absorption.

CORIANDRUM, L. E. CORIANDRUM SATIVUM, SEMINA, D. *Coriander. The fruit (Seeds,* D.*) of Coriandrum sativum.* A native of the South of Europe, scarcely indigenous; belonging to the Natural family *Umbelliferæ (Apiaceæ,* Lindley), and to the Linnæan class and order *Pentandria Digynia.*

BOTANICAL CHARACTERS.—Annual; Stem, erect, leafy, about 18 inches high; Leaves, scarcely stalked, all bipinnate, and cut; Flowers, white, often with a reddish tint.

PROPERTIES.—The fruit commonly called *coriander-seed* is round, about the size of white pepper, finely ribbed, of a brownish-yellow colour. When ripe it has an agreeable aromatic odour, and a warm peculiar taste. Its properties depend on volatile oil, of which it contains 4·7 parts in a thousand.

THERAPEUTICAL EFFECTS.—Coriander is employed in medicine as a flavouring adjunct in some officinal preparations, but is not used alone. The dose of the fruit is from 3ss. to 3i.

CUMINUM, E. CYMINUM, L. *Cummin. The fruit of Cuminum cyminum.* A native of Greece and Egypt; belonging to the Natural family *Umbelliferæ (Apiaceæ,* Lindley), and to the Linnæan class and order *Pentandria Digynia.*

The fruit of this plant commonly called *cummin-seed,* possesses aromatic stimulant properties, which depend on the presence of volatile oil; but as the odour and taste are both strong and disagreeable, I cannot imagine on what grounds it has been retained in the London and Edinburgh Pharmacopœias, when we have so many agreeable medicines with precisely analogous properties. Dose, of the fruit, gr. x. to 3ss.

DAUCI FRUCTUS, L. DAUCI SEMINA, D. DAUCI RADIX, D. L. E. *The common carrot. Fruit (Seeds,* D.*) of Daucus carota (var. sylvestris,* D.*). The root of Daucus carota (var. sativa,* E.*).* Indigenous; belonging to the Natural family *Umbelliferæ (Apiaceæ,* Lindley), and to the Linnæan class and order *Pentandria Digynia.*

BOTANICAL CHARACTERS.—Root, slender, yellowish, becoming thick and succulent by cultivation *(var. sativa);* Stem, 2-3 feet high, hispid; Leaves, pinnatisect; Flowers, in large umbels, white, except the central neutral one, which is blood-red.

PROPERTIES.—The fruit commonly called *carrot-seed* is obtained from the uncultivated variety; it is small, compressed, ovate, of a brown colour, fringed with a row of whitish spines; it has a strong aromatic odour and taste which depend on volatile oil. The root which is obtained from the cultivated carrot, is too well known to require description. It contains a trace of volatile with some fixed oil, a peculiar, ruby-red crystalline substance *(Carotin),* uncrystallizable sugar, fecula, albumen, malic acid, &c.

Therapeutical Effects.—The fruit of the wild carrot is carminative and stimulant, and by many is held to be diuretic; it is scarcely ever used at present. Carrot-root when boiled forms one of the most nutritive of our esculent vegetables. In medicine it is only used as an external application in the form of poultice to stimulate foul, indolent, and gangrenous sores; it corrects the fetor, and promotes the separation of the sloughs.

Dose and Mode of Administration.—Of the fruit, gr. xx. to ℈i.—*Cataplasma Dauci*, D. (Take of the root of the cultivated carrot, any quantity; boil it in water until it becomes soft enough to form a cataplasm). Used for the purposes above stated.

Dianthus caryophyllus, flores, D. *Clove-pink. Flowers of Dianthus caryophyllus.* Indigenous; belonging to the Natural family *Caryophyllaceæ*, and to the Linnæan class and order *Decandria Digynia.*

These flowers were at one time supposed to possess some stimulant properties, and were employed in nervous and spasmodic diseases; but they are never used in the present day.

Electricity. Galvanism. Magnetic Electricity. These powerful agents in the treatment of disease require some short notice here. Their operation is that either of a general or local stimulant, according to the manner in which they are applied. Under their influence the vascular and nervous systems, more especially the latter, are excited; the pulse is increased in frequency, the muscles stimulated to involuntary action, and the general secretions augmented. The diseases then in which their use is indicated are those of debility; thus they are employed in all forms of paralysis of the nerves, both of sensation and of motion, when uncomplicated with any lesion of, or determination of blood to, the cerebro-spinal system; as in some forms of nervous deafness and of amaurosis, in old cases of paraplegia and hemiplegia, in paralysis of the muscles of the fore-arm from the poison of lead or of mercury, and in asphyxia. In suppression of the menstrual discharge arising from loss of tone in the uterine organs, electrical shocks passed through the pelvis (from the sacrum to the pubis) are frequently productive of great benefit. In the loss of muscular power attendant on chronic rheumatism, and in chorea and other allied convulsive disorders, the employment of electricity often proves serviceable also. My own experience of its use as a remedial agent leads me to place more reliance on its employment in *local* than in *general* paralysis—more particularly when a single muscle or a certain class of muscles have become paralysed from any special cause. Thus I have derived peculiar benefit from its use in that particular form of paralysis of the muscles of the fore-arm, which is produced by the action of lead, and which is so frequent a sequence of painters' colic; as also in those cases where a single muscle becomes paralysed, either from exposure to a draught of cold air, or from

continued pressure on the nerve by which the muscle is supplied.* The different forms of electricity may be in general indifferently applied, but *galvanic* and *magnetic* electricity possess the advantages of being more readily employed, of not being interfered with by the state of the atmosphere, of the effects produced being more under control, and of the facility with which they may be applied to the different parts of the body; consequently these forms of electricity are in the present day most generally used.

For the application of common electricity, Leyden jars charged with the cylindrical or plate machine are used, and the usual directors employed for discharging them; the patient may or may not be placed on an insulating stool or chair, according to the effect which it is wished to produce.

Galvanic electricity is applied by means of the usual galvanic troughs and insulated directors; the apparatus is objectionable in consequence of its not being very portable, and also from its requiring the use of acids to bring it into operation.

Magnetic-electricity is the most convenient and simple mode of employing this agent in the practice of medicine; it is most readily applied by means of an instrument consisting of a small battery, on Smee's principle, in connection with a frame on which is fixed an upright straight magnet, surrounded by a bundle of iron wires, round which are coiled some thousand yards of insulated large and small copper wire, divided into seven different portions, each of which terminates separately in a small brass nob, brought up through the bottom of the frame. The shocks are produced by the continuity of the stream of electricity being broken by the alternate attraction and repulsion, by the magnet, of a piece of soft iron, which is kept in contact with a platinized screw by means of a piece of watch spring.†

The good effects of any of the forms of electricity require a long time for their development, and its use should be consequently persevered in for some time, and not despaired of, if immediate relief be not experienced. Care must be, however, taken to regulate the force or intensity of the shock, as over-excitement from electricity in general proves highly injurious in those very cases, in which its employment, if properly regulated, is attended with the greatest service. In fine it should be always borne in mind, that electricity is only to be considered as an auxiliary to other modes of treatment.

Elemi, L. E. Amyris elemifera, resina, D. *Elemi. Concrete resinous exudation from one or more unascertained plants*, E. *Resin of Amyris elemifera*, D. L. It is quite uncertain from what plant this substance is obtained, and even its commercial route is involved in much obscurity; what is met with in this country is brought from Holland.

* See Edinburgh Monthly Journal of Medical Science, Vol. 6, p. 225.

† Magnetic-electrical instruments on the plan described above, are made by Mr Robinson of Grafton-street, in this city, at a cost varying from £3 10*s*. to £4 4*s*.

American elemi is obtained from the *Icica icicariba,* a plant belonging to the Natural family *Amyridaceæ.* The term elemi is applied to three or four resins of very different appearance, and much of what is sold under this name appears to be a very composite substance. It is only employed in medicine in the form of ointment as a stimulating dressing to old and indolent ulcers.—*Unguentum Elemi,* D. L. ("Elemi, ℔j.; white wax, ℔ss.; prepared hog's lard, ℔iv.; make an ointment which while yet hot should be strained through a sieve," D.—"Elemi, ℔j.; common turpentine, ℥x.; suet, ℔ij.; olive oil, f℥ij.; melt the elemi with the suet; then remove them from the fire, and immediately mix with them the turpentine and the oil; afterwards press through a linen cloth," L.).

Fœniculum, L. E. Anethum fœniculum, semina, D. *Fennel. Fruit of Fœniculum officinale,* E. *Fruit of Fœniculum vulgare.* L. *Seeds of Anethum fœniculum,* D. *Fœniculum vulgare (Anethum fœniculum,* Linnæus) is an indigenous plant; belonging to the Natural family *Umbelliferæ (Apiaceæ,* Lindley), and to the Linnæan class and order *Pentandria Digynia.*

Botanical Characters.—Biennial; Stem, 3-4 feet high, fistulose; Leaves, much divided, with very slender segments; Flowers, dark yellow.

Properties.—The fruit, commonly called *fennel-seed,* is oval, about two lines long and one broad, of a dark brown colour; it has an agreeable, aromatic odour, and a warm sweetish, somewhat acrid taste. These properties depend on a volatile oil which it contains. The oil of fennel of the shops is usually obtained from a cultivated variety of *Fœniculum vulgare,* which in consequence of the sweeter taste of the fruit is known under the name of *Fœniculum dulce.*

Therapeutical Effects.—Fennel is a warm aromatic stimulant, but is not much used in the present day; it may be employed in the same cases as anise and caraway.

Dose and Mode of Administration.—In substance, ʒss. to ʒi.—*Oleum Fœniculi,* D. E. (Prepared from the fruit (seeds of *Fœniculum dulce,* D.) according to the general instructions for obtaining volatile oils). Dose, min. ij. to min x.—*Aqua Fœniculi,,* D. L. E. (Prepared in the same way as Aqua Carui, D. L.—as Aqua Anethi. E.). An aromatic vehicle for other medicines; Dose, f℥j. to f℥iv.

Inula, L. Inula helenium, radix, D. *Elecampane. Root of Inula helenium.* Indigenous; belonging to the Natural family *Compositæ (Asteraceæ,* Lindley), and to the Linnæan class and order *Syngenesia Superflua.*

Botanical Characters.—Root, thick, branching, perennial; Stem, 3-5 feet high, branched; Leaves, amplexicaul, ovate, wrinkled, downy beneath; Flower, large, terminal, bright-yellow.

Properties.—Elecampane-root when dried has an aromatic odour, and a warm bitter taste. It consists of bitter extractive, soft resin, elecampane-camphor *(Helenin)*, a variety of starch named *Inulin*, a trace of volatile oil, &c. It yields its active properties partially to water, but more completely to alcohol.

Therapeutical Effects.—Elecampane is an aromatic stimulant, producing vomiting in large doses. It is scarcely ever used in medicine, and might be well spared from the pharmacopœias. Dose, ℈i. to ʒij.

Laurus nobilis, folia et baccæ, D. L. *Sweet-bay leaves and berries. Leaves and berries of Laurus nobilis.* A native of the South of Europe, cultivated in our shrubberies; it belongs to the Natural family *Lauraceæ*, and to the Linnæan class and order *Enneandria Monogynia.*

Botanical Characters.—A small tree; Leaves, alternate, lanceolate, coriaceous; Flowers, in axillary umbels, yellowish; Fruit, a bluish-black, oval berry, one-seeded, about the size of a small nut.

Properties.—The leaves and fruit have an aromatic, rather agreeable odour, and a warm, somewhat bitter taste. These properties depend on a volatile oil which may be obtained by distillation. The berries contain also about 12 per cent of a butyraceous fixed oil, which has been recently imported from Trieste.

Therapeutical Effects.—The leaves, berries, and oils of the sweet bay are aromatic stimulants; but are scarcely ever employed in medicine. The oil was formerly employed as a local stimulant in rheumatic and neuralgic pains, and is used as such with great benefit on many parts of the Continent in the present day. The leaves and berries may be administered in the form of infusion, prepared by infusing ʒiss. of either, bruised, in fʒxij. of boiling water; Dose, fʒss. to fʒij.

Lavandula, L. E. Lavandula spica, flores, D. *Lavender. Flowers of Lavandula spica* D. L.—*of Lavandula vera*, E. It is from *Lavandula vera* (De Candolle) that the flowers are procured for medical use; this is a native of the central parts of Europe, and is cultivated in our gardens; it belongs to the Natural family *Labiatæ (Lamiaceæ*, Lindley), and to the Linnæan class and order, *Didynamia Gymnospermia.*

Botanical Characters.—Stem, shrubby, 1-2 feet high; Leaves, oblong-linear or lanceolate, quite entire; Flowers, purplish-gray, in whorls of 6-10 flowers, in interrupted spikes. It may be readily distinguished from *Lavandula spica*, by its taller stature, its narrower leaves, and the absence of bracts.

Physical Properties.—The flowers are gathered when in full bloom, and dried in the shade: they have a peculiar fragrant odour, and a warm somewhat bitter, aromatic taste.

Chemical Properties.—They contain volatile oil, tannin, bitter extractive, and woody fibre. The oil, *Oleum Lavandulæ*, D. L. E., is obtained by the usual process of distillation; it is of a pale yellow colour, has the peculiar fragrant odour of the flowers, and a warm aromatic taste. One pound of flowers yields about two drachms of oil. Its density is about ·900; its composition, according to Kane, is $C^{15}H^{14}O^2$. Lavender flowers yield thier properties completely to alcohol, but only partially to boiling water.

Therapeutical Effects.—Lavender is a very agreeable aromatic stimulant, and its officinal preparations are consequently much employed for giving warmth and flavour to other medicines.

Dose and Mode of Administration.—The flowers in powder are added to sternutatories on account of their agreeable odour.—*Oleum Lavandulæ*, D. L. E. Dose, min. ij. to min. v.—*Spiritus Lavandulæ*, D. L. E. (Fresh lavender, ℔ij. (℔iiss. L. E.); proof (rectified, L. E.) spirit, cong. j.; (water, sufficient to prevent empyreuma, D., Oij., L.); "macerate for 24 hours, and distil with a medium heat ℔v. *by measure*," D. "Mix, and with a slow fire distil a gallon," L. "Mix, and with the heat of a vapour-bath distil over Ovij." E.). Used in the preparation of the following:—*Spiritus (Tinctura, L.) Lavandulæ compositus*, D. L. E. (Spirit of lavender, *by measure* ℔iij. (Oiss., L. Oij., E.); spirit of rosemary, *by measure* ℔j. (Oss., L. f℥xij., E.); nutmegs, bruised, ℥ss. (℥iiss., L.); cinnamon, bruised (in coarse powder, E.), ℥ss. (℥iiss., L. ℥j., E.); (cloves, bruised, ℥ij., D. E.); red sandal-wood shavings, ℥i. (℥v., L. ℥iij., E.); macerate (digest, D.) for 10 (14, L. 7, E.) days and strain; "strain through calico," E.) This preparation, generally known as *Lavender Drops*, is used as a cordial and stomachic to relieve nausea, flatulence, lowness of spirits, &c.; Dose, min. xxx. to f℥ij. in water, or dropped on white sugar.

Incompatibles.—Sulphate of iron.

Limonum cortex et oleum, L. E. Citrus medica, tunica exterior et ejus oleum volatile, D. *The external rind of the fruit, and the volatile oil obtained from the rind, of Citrus limonum*, L. E.—*of Citrus medica*, D. *Lemon peel, and oil of lemons.* The lemon tree has been described in the division *Refrigerants*. *Oil of lemons* is obtained from the rind either by distillation or expression, the latter is the method usually followed; it is imported from Portugal and from France. It has a pale greenish-yellow colour, the fragrant odour of lemons, and a pungent aromatic taste; density 0·847. Its composition is $C^{10}H^8$. *Lemon peel* is of a yellow colour, has an agreeable aromatic odour, and a warm, somewhat bitter taste, both of which are much injured by drying. Care should be taken in peeling lemons to remove the outer yellow rind only; it should be dried without artificial heat, and is best preserved laid in alternate layers with sugar, and kept in well closed bottles. Lemon peel yields its properties to both alcohol and water.

Therapeutical Effects.—Oil of lemons is an aromatic stimulant; it is only used internally to give an agreeable flavour to other medi-

cines; as a topical remedy it is highly praised by the Germans as a stimulant in rheumatic and scrofulous ophthalmia, for which purpose it is dropped into the eye. Lemon peel is employed as a flavouring ingredient in infusions. The dose of oil of lemons is from min. ij. to min. v.

INCOMPATIBLES.—The mineral and vegetable acids; and lime water.

MASTICHE, D. L. E. *Mastich. The resin (Concrete resinous exudation, E.) of Pistacia lentiscus,* (also of *Pistacia atlantica,* Lindley), Natives of the South of Europe and of the Levant; belonging to the Natural family *Anacardiaceæ,* and to the Linnæan class and order *Diœcia Pentandria.*

Mastich exudes from incisions made into the tree; it is in small, irregular, yellowish tears, which have a faint, agreeable odour, and a warm taste. It is scarcely ever used at present, but was at one time much employed as an ingredient in *dinner pills.* It enters into the composition of the *Tinctura Ammoniæ composita,* L. (See page 283).

MELISSA, E. MELISSA OFFICINALIS, HERBA, D. *Common Balm. Herb of Melissa officinalis.* A native of Central Europe, cultivated in our gardens; it belongs to the Natural family *Labiatæ (Lamiaceæ,* Lindley), and to the Linnæan class and order *Didynamia Gymnospermia.*

BOTANICAL CHARACTERS.—Herbaceous; Leaves, broadly ovate, crenate, hairy above, smooth beneath; Flowers, white, in one-sided, axillary whorls, shortly pedunculated.

PROPERTIES.—In the recent state the whole herb has an aromatic, citron-like odour, much of which is lost by drying, the taste is warm and bitter. It contains volatile oil, resin, bitter extractive, a trace of tannin, gum, &c. It yields its properties to boiling water by infusion.

THERAPEUTICAL EFFECTS.—Balm is a mild aromatic stimulant, at present never used except as a domestic remedy. *Infusum Melissæ; Balm tea* (prepared by infusing ℥ij. of the fresh herb in Oss. of boiling water for a quarter of an hour,) is given in doses of from f℥ij. to f℥iv.

INCOMPATIBLES.—Sulphate of iron; acetate of lead; and nitrate of silver.

MENTHA PIPERITA, HERBA, D. L. E. *Peppermint. Herb of Mentha piperita.* Indigenous; belonging to the Natural family *Labiatæ (Lamiaceæ,* Lindley), and to the Linnæan class and order *Didynamia Gymnospermia.*

BOTANICAL CHARACTERS.—Root creeping; Stem, smooth, quadrangular; Leaves, ovato-lanceolate, strongly serrated, acute, slightly hairy; Flowers, violet coloured, in lax, short, interrupted spikes; bracteas lanceolate.

Properties.—Peppermint has a peculiar, aromatic, to most persons agreeable, odour, and a warm, pungent taste, leaving a peculiar impression of coldness on the mouth which is most marked during inspiration. These properties are due to a large quantity of volatile oil which exists in small vesicles or glands, chiefly in the leaves. This oil, *Oleum Menthæ piperitæ*, D. L. E., is obtained by the usual process of distillation, the quantity procured varies from a 200th to a 320th; it is limpid and colourless, acquiring a greenish tint from age, with the odour and taste of the plant in an intense degree. It is soluble in alcohol, and when agitated with water imparts to it both odour and taste. Its density is 0·902; and its composition $C^{21}H^{20}O^2$ (Kane).

Therapeutical Effects.—Peppermint is perhaps the most powerful aromatic stimulant of the Labiate plants; and in consequence of its agreeable odour and taste is very generally added to nauseous medicines. It is also much employed to relieve sickness of the stomach, heartburn and flatulent colic.

Dose and Mode of Administration.—Of the volatile oil, min. ij. to min. v. dropped on sugar.—*Aqua Menthæ piperitæ*, D. L. E. ("Herb of peppermint, ℔iss.; water, sufficient to prevent empyreuma; distil a gallon," D.—"Peppermint, dried, ℔ij. (or oil of peppermint, ʒij.); proof spirit, fʒvij.; water, cong. ij.; distil a gallon," L.—"Peppermint, ℔iv. if fresh, (℔ij. if dry); water, cong. ij.; rectified spirit, fʒiij.; mix, and distil one gallon," E.). Employed to relieve flatulent colic, but chiefly as a vehicle for other medicines; Dose, fʒj. to fʒij.—*Spiritus Menthæ piperitæ*, D. L. *Spiritus Menthæ*, E. ("Oil of peppermint, *by weight* ʒss. (ʒiij., L.); rectified (proof L.) spirit, cong. j.; water, sufficient to prevent empyreuma (Oj., L.); mix, and with a slow fire distil a gallon," D. L.—"Fresh peppermint, ℔iss.; proceed as for spirit of caraway," E.). Stimulant and carminative; Dose, fʒss. to fʒi.—*Essence of Peppermint* of the shops is prepared by dissolving fʒi. of the oil in fʒi. of rectified spirit; the dose is from gtt. xx. to gtt. xxx. on sugar.

Mentha pulegium, herba, D. L. Pulegium, E. *Pennyroyal. Herb of Mentha pulegium.* Indigenous; belonging to the Natural family *Labiatæ (Lamiaceæ*, Lindley), and to the Linnæan class and order *Didynamia Gymnospermia.*

Botanical Characters.—This mint is distinguished by its prostrate stems, and small, frequently recurved leaves; both of which are thickly covered with short hairs.

Properties.—Pennyroyal has a strong, peculiar, aromatic odour, and a pungent, somewhat bitter, cooling taste; it contains a volatile oil on which its properties depend, and which is obtained by the usual process of distillation; it is of a pale greenish-yellow colour, with the odour and taste of the plant; its density is 0·925; and ts composition $C^{10}H^8O$ (Kane).

Therapeutical Effects.—Pennyroyal is identical in action with peppermint, but as its odour and taste are not so agreeable, it is much less used.

Dose and Mode of Administration.—*Oleum Menthæ Pulegii*, D. L. E.—*Spiritus Menthæ Pulegii*, L.—*Aqua Menthæ Pulegii*, D. L. E.—*Essence of Pennyroyal* of the shops: are all prepared with pennyroyal in the same manner as the corresponding preparations of peppermint. The doses also are the same.

Mentha viridis, herba, D. L. E. *Spearmint. Herb of Mentha viridis.* Indigenous; belonging to the Natural family *Labiatæ (Lamiaceæ*, Lindley), and to the Linnæan class and order *Didynamia Gymnospermia.*

Botanical Characters.—Leaves, lanceolate, acute, glabrous, sessile; Spikes, interrupted, cylindrical, loose; Bracteas setaceous, somewhat hairy as well as the calyx.

Properties.—Spearmint has a strong, peculiar, to many persons disagreeable, odour, and a warm, bitter taste followed by a sense of coldness when air is drawn into the mouth; these properties are very much lost by drying. They depend on a volatile oil, of which the fresh herb contains only a 500th part. This oil is of a light-yellow colour, acquiring a reddish-brown tint by age; it possesses intensely the odour and taste of the plant. Its density is 0·914; and its composition $C^{35}H^{28}O$ (Kane).

Therapeutical Effects.—Spearmint resembles in its action peppermint; by some it has been said to repel the secretion of milk, and to act as an emmenagogue. As it is neither as powerful nor as agreeable as peppermint it is not so much used.

Dose and Mode of Administration.—*Oleum Menthæ viridis*, D. L. E. *Spiritus Menthæ viridis*, D. L. E. *Aqua Menthæ viridis*, D. L. E.—*Essence of Spearmint* of the shops: are all prepared with spearmint, in the same manner as the corresponding preparations of peppermint. The doses also are the same.—*Infusum Menthæ simplex*, D. (Dried spearmint leaves, ʒij.; boiling water, a sufficient quantity to afford fʒvj. of strained liquor). Used as a vehicle for other remedies in irritable states of the stomach; Dose, fʒi. to fʒij.—*Infusum Menthæ compositum*, D. (Dried spearmint leaves, ʒij.; boiling water, a sufficient quantity to afford fʒvj. of strained liquor; digest for half an hour in a covered vessel, and strain when cold; then add pure sugar, ʒij.; oil of spearmint, gtt. iij. dissolved in fʒss. of compound tincture of cardamoms, and mix). Stomachic and stimulant, useful in nausea and flatulent colic, and to conceal the taste of other medicines; Dose, fʒi. to fʒiij.

Myristica, L. E. Myristicæ oleum, L. E. Myristicæ adeps, E. Myristica moschata, nucleus, oleum volatile, et involucrum—Macis dictum, D. *Nutmegs. Kernel of the fruit and volatile*

*oil from the kernel,* D. L. E. *Involucrum (arillus) of the nut (mace),* D. *And concrete expressed oil (oil of mace) from the kernel of the fruit,* E.—*of Myristica moschata,* D. L.—*of Myristica officinalis,* E. A native of the Molucca Islands; belonging to the Natural family *Myristicaceæ,* and to the Linnæan class and order *Diœcia Monadelphia.*

Botanical Characters.—A tree, 20-30 feet high; Leaves, aromatic, oblong, acuminate, smooth, simple nerved; Flowers, pale yellow, in axillary racemes; Fruit, pyriform, about the size of a peach, smooth, dehiscing by two nearly equal longitudinal valves, and exposing the fleshy, scarlet arillus *(mace),* closely embracing the shell, within which is contained the kernel *(the nutmeg).*

Properties.—Nutmegs and mace are too well known to require description; they are imported from the Moluccas. They have a peculiar, fragrant, powerful odour, and a warm, aromatic taste. Nutmegs consist of 31·6 per cent of fat butyraceous fixed oil, 6 of volatile oil, 2·4 of starch, 1·2 of gum, 0·8 of acid, and 54 of lignin (Bonastre). The volatile oil, *Oleum Myristicæ,* D. L. E., is obtained by distillation; it is usually imported. It is colourless or slightly yellow, of a rather viscid consistence, and has the odour and taste of nutmegs. Its density is 0·948. The fixed oil, *Myristicæ Adeps,* E., *oil of mace,* is procured by exposing bruised nutmegs to the vapour of boiling water, and pressing between heated plates of iron; it is imported in large rectangular cakes covered with the leaves of some monocotyledonous plant. It is a soft solid, of a reddish-yellow colour, with the odour and taste of nutmegs. It consists of an aromatic volatile oil, mixed with three fats; two of which are readily dissolved by alcohol, and the third which is thus separated has been named *myristicine.* Mace is composed of volatile oil, red fat oil soluble in alcohol, yellow fat oil insoluble in alcohol, alcoholic extractive, amidin, lignin, &c. Nutmegs and mace impart both odour and taste to boiling water; but they yield their active properties more completely to alcohol.

*Adulterations.*—Nutmegs from which the volatile oil has been obtained, are sometimes mixed with good nutmegs, the holes which were bored in them being stopped up with powdered sassafras. This fraud is seldom attempted in the present day, it may be detected by the lightness of the nutmeg. Those nutmegs which are round, plump, heavy, and not worm eaten, should be chosen.

Therapeutical Effects.—Nutmegs are agreeable aromatic stimulants, chiefly used as flavouring ingredients. Taken in large quantity they prove narcotic, and consequently their use should be avoided by those who have an apoplectic or paralytic tendency. The fixed oil has been employed externally as a stimulant in chronic rheumatism and paralysis. Mace is not used in medicine, its properties are similar to those of nutmegs.

Dose and Mode of Administration.—In substance, gr. x. to gr. xxx.—*Oleum Myristicæ,* D. L. E. Min. j. to min. v. dropped on sugar.—*Spiritus nucis moschatæ,* D. *Spiritus Myristicæ,* L. E. (Nutmegs, bruised, ℥ij. (℥iiss. L. E.); proof spirit, cong. j.; water, sufficient to prevent empyreuma (Oj, L. E.); mix (macerate for 24 hours, D.), and

(with a slow fire, L.) distil a gallon). Stimulant and aromatic, an excellent addition to cathartic mixtures to prevent griping. It may be prepared extemporaneously by dissolving min. xx. of the volatile oil in f℥i. of proof spirit. Dose, f℥i. to f℥iv.

Olibanum, D. L. *Gum-resin of Boswellia serrata (Libanus thurifera,* Colebrooke). A handsome lofty tree, a native of Coromandel and other parts of the East Indies; belonging to the Natural family *Amyridaceæ,* and to the Linnæan class and order *Decandria Monogynia.*

Olibanum is met with in the form of irregularly rounded, whitish or yellowish tears, semitransparent, powdery on the surface; they have a fragrant odour, and an aromatic somewhat bitter taste. They consist principally of volatile oil and resin, and are insoluble in either water or alcohol. This substance is generally supposed to be the true frankincense of the ancients; it possesses mildly stimulant properties, but in the present day is only employed as a fumigating agent. The dose for internal use would be from ℥ss. to ℥i. made into an emulsion with yolk of egg or with mucilage.

Origanum, L. E. Origanum vulgare, oleum ex herba, D. Origanum majorana, herba, D. *Herb (Volatile oil,* D.) *of Origanum vulgare,* D. L. E.—*Herb of Origanum majorana,* D.—*Origanum vulgare,* the common marjoram, is an indigenous plant belonging to the Natural family *Labiatæ (Lamiaceæ,* Lindley), and to the Linnæan class and order *Didynamia Gymnospermia. Origanum majorana,* or sweet marjoram, is a native of Africa and of Asia, and is commonly cultivated in this country as a pot-herb.

Properties.—Both plants have a peculiar aromatic odour, that of the latter being much stronger, and a warm pungent taste; these properties depend chiefly on volatile oil. —*Oleum Origani,* D. L., *Oil of Marjoram, Oil of Thyme,* is obtained from *Origanum vulgare* by the usual process of distillation. It is of a reddish colour, becoming darker by age, and has the odour and taste of the herb. Its density is 0.867; and its composition $C^{50}$ $H^{40}$ O. A hundred weight of the plant yields on an average from 8 to 10 ounces of oil.

Therapeutical Effects.—The marjorams possess the aromatic stimulant properties of the Labiate plants generally. In the present day they are but seldom used in medicine; the oil may be given in doses of from min. j. to min iij. dropped on sugar. It is sometimes employed to relieve tooth-ache, dropped on cotton and placed in the hollow of a carious tooth. Dissolved in olive oil, it is used as a stimulating embrocation.

Pimenta, D. L. E.—*Pimento; Allspice; Jamaica pepper. Fruit (Dried unripe berries,* L.) *of Myrtus pimenta,* D. L.—*Unripe berries of Eugenia pimenta,* E. (and of *Eugenia acris,* Lindley), natives of the West Indies; belonging to the Natural family *Myrtaceæ,* and to the Linnæan class and order *Icosandria Monogynia.*

Botanical Characters.—A handsome tree, about 30 feet high; Leaves, oblong, pellucid-dotted, about 4 inches long; Flowers, numerous, greenish-yellow, in terminal bunches or panicles; Berry, succulent, dark-purple when ripe, 2-seeded.

Properties.—Pimento is in the form of round blackish berries, rough, umbilicated with the persistent teeth of the calyx. The odour resembles a mixture of cloves, cinnamon, and nutmegs, whence the name *allspice;* the taste is pungent and aromatic, like that of cloves. These properties depend principally on volatile oil, of which Bonastre obtained 10 per cent from the husk and only 5 per cent from the kernel. This oil, *Oleum Pimentæ,* D. L. E., is obtained from the berries by the usual process of distillation; it is of a yellowish colour when first drawn, but soon acquires a reddish tint; it has the peculiar odour of allspice, and a burning aromatic taste. Oil of allspice of commerce is heavier than water, its density being about 1,020. It is a mixture of a heavy and light oil, which may be obtained separately by distillation with solution of potash, as the former forms crystalline compounds with the alkalies. Pimento communicates both odour and taste to boiling water, but it yields its properties more completely to alcohol.

Therapeutical Effects.—Pimento is an aromatic stimulant, not much employed in medicine. Its preparations are chiefly used to communicate warmth and flavour to other substances.

Dose and Mode of Administration.—In substance, from ʒss. to ʒj. —*Oleum Pimentæ,* D. L E, min ij. to min. v —*Spiritus Pimentæ,* D.L. E. (Pimento, bruised, ʒiij. (ʒiiss., L. ℔ss., E.); proceed as for spirit of nutmeg, D. L.—as for spirit of caraway, E.). Dose, fʒj to fʒij.—*Aqua Pimentæ,* D. L. E. ("Pimento, bruised, ℔ss.; water, sufficient to prevent empyreuma; macerate for 24 hours and distil a gallon," D.—"Pimento, bruised, ℔i. (or oil of pimento, ʒij., L.); proof (rectified, E.) spirit, fʒvij. (fʒiij., E.); water, cong. ij.; mix, and distil a gallon," L. E.). Carminative and stimulant, used in the flatulent colic of children, and as a vehicle for other medicines. Dose, fʒi. to fʒij.

Incompatibles.—The sesqui-salts of iron.

Piper longum, L. E. Piper longum, semina, D.—*Long pepper. Dried spikes (Dried unripe fruit,* L. *Seeds,* D ) *of Piper longum (Chavica Roxburghii.)* A native of India, belonging to the Natural family *Piperaceæ,* and to the Linnæan class and order *Diandria Trigynia.*

Botanical Characters.—A small shrubby climber; Leaves, alternate, petiolate, ovato-cordate; Flowers, small; closely set on the axillary spadices.

Properties.—Long pepper consists of the spadices which are gathered before they are fully ripe, and dried in the sun. As met with in commerce, they are of a grayish colour, hard, about an inch and a half in length, cylindrical, striated diagonally on their surface. They have a somewhat aromatic odour, and a very pungent spicy taste. The composition of long pepper is almost identical with that of black pepper, (See next article).

Therapeutical Effects.—This pepper is somewhat more acrid than *piper nigrum*, but it may be employed in the same cases. Dose, gr. v. to ʒi.

Piper nigrum, L. E. Piper nigrum, semina, D.—*Black pepper. Dried unripe berries (Berries,* L. *Seeds,* D.) *of Piper nigrum.* A native of the continent of India, cultivated in the East and West Indian islands; it belongs to the Natural family *Piperaceæ*, and to the Linnæan class and order *Diandria Trigynia.*

Botanical Characters.—Stem, shrubby, climbing, 8-12 feet long, jointed, dichotomous; Leaves, elliptical, acuminate, 5-7 nerved; Flowers, whitish, small, covering thickly a cylindrical, pendulous spadix; Fruit, distinct, at first green, changing as it ripens to bright red, and finally to black.

Physical Properties.—Before the berries on each spike have all changed to red, they are collected and dried in the sun, to constitute black pepper. White pepper is procured by soaking the fully ripe seeds in water, so as to enable the outer husk to be afterwards removed by rubbing. Black pepper consists of small spherical bodies, blackish and rough externally, whitish within, consisting of the outer wrinkled tegument, surrounding the hard smooth seed. It has a strong, peculiar aromatic odour, and a very pungent acrid taste. White pepper is the white nucleus, the outer black tegument having been removed.

Chemical Properties.—Black pepper is composed of a neutral crystalline principle, which has been named *Piperin*, of a very acrid soft resin, balsamic volatile oil, extractive, gum, bassorin, starch, malic and tartaric acids, &c. The active principles are the *piperin*, resin, and volatile oil. Piperin may be readily prepared by Poutet's process as follows: "Prepare an alcoholic extract of black pepper, digest in a solution of caustic potash, and agitate with water; filter and wash carefully with water what remains on the filter; dissolve it in warm alcohol, and crystallize by cooling." As usually met with, Piperin is a dark yellow, resinous looking substance, but it may be obtained in transparent, colourless, four-sided prisms; it is tasteless and inodorous, is insoluble in cold water, dissolves sparingly in boiling water or cold alcohol, but is very soluble in boiling alcohol; it melts at 212°, it is a neutral principle; its composition is $C^{34}$ $H^{19}$ $O^{6}$ N. Black pepper imparts its properties partially to water, but more completely to alcohol.

Therapeutical Effects.—Pepper is an acrid aromatic stimulant, in general use as a spice. It also possesses remarkable febrifuge properties, which reside in the piperin. This substance has been employed with much success in the treatment of ague, and has succeeded in many instances in effecting a cure in cases where quina and other remedies have failed. An interesting account of the employment of piperin in the treatment of intermittent fevers in the Island of Trinidad by Dr. Hartle, has been published in the 55th vol. of the Edinburgh Medical Journal. As a stimulant, black pepper will be found a useful addition to bitters in atony of the digestive organs; externally it is used in the form of oint-

ment to chronic diseases of the scalp, and as an adjunct to rubefacient cataplasms.

Dose and Mode of Administration.—In substance, gr. v. to gr. xx.—*Piperin* is given in doses of gr. iij. to gr. v. every hour until gr. xviij. have been taken. It may be made into pill with mucilage or conserve of roses.—*Confectio Piperis nigri*, D. L. E. (Black pepper; and elecampane root (liquorice root, E.), of each ℔i.; fennel seeds, ℔iij.; honey; and white sugar, of each, ℔ij.; rub the dry ingredients together to a very fine powder; "add water, ℔j. and beat into a uniform mass," D.—"Keep in a covered vessel, and whenever the confection is to be used, the honey being added, pound them until they are thoroughly incorporated," L.—"Beat the whole into a uniform mass," E.). This preparation was introduced into the Pharmacopœias as a substitute for a quack medicine called *Ward's paste for piles*. It will be found useful in hemorrhoids occurring in the weak and debilitated. Dose, ʒi. to ʒij.; to derive any benefit from its use it must be persevered in for two or three months.—*Unguentum Piperis nigri*, D. (Prepared hog's-lard, ℔j.; black pepper, in powder, ʒiv.; make into an ointment). At one time highly praised as a remedy for chronic diseases of the scalp.—*Rubefacient Cataplasm*, Paris Codex. (Barley meal, ʒiv.; vinegar, ʒi.; whites of three eggs; water, sufficient to make a cataplasm of a proper consistence; spread on linen, and sprinkle over it half an ounce each of black pepper and of fennel in fine powder). A speedy rubefacient.

Incompatibles.—Astringent vegetable preparations.

Porrum, L.—*The Leek. Bulb of Allium porrum.* A native of Egypt, cultivated in our gardens; it belongs to the Natural family *Liliaceæ*, and to the Linnæan class and order *Hexandria Monogynia*. The leek is never used in medicine, although retained in the London Pharmacopœia.

Potassii sulphuretum, L. E. Potassæ sulphuretum, D. *Sulphuret of Potassium. Liver of Sulphur.*

Preparation.—D. L. E. "Carbonate of potash, ʒiv. (4 parts, D.); sublimed sulphur, ʒj. (1 part, D.); rub them together; and in a covered crucible place them on a fire (the heat being gradually increased, D.) until they unite." (Preserve in well closed vessels, D. Break to pieces, and keep in well closed bottles, E.).

Physical Properties.—This preparation occurs in various sized pieces, of a liver-brown colour, hard and fragile; inodorous when quite free from moisture, but emitting the disagreeable odour of sulphuretted hydrogen when moistened. It has an acrid, bitter, alkaline taste.

Chemical Properties.—It is a mixture of 3 eq. of tersulphuret of potassium, and 1 of sulphate of potash ($3\,KS^3 + KO,\,SO^3$). By exposure to the air it deliquesces, attracts oxygen, and is all converted into sulphate of potash, becoming white and inodorous. It is readily soluble in water; the solution is of a yellow colour, and highly alkaline.

*Adulterations.*—This preparation is seldom met with in a pure state in the shops, in consequence of its undergoing decomposition so readily. The following are the tests of the London Pharmacopœia for its purity:—"Fresh broken it exhibits a brownish-yellow colour; dissolved in water, or in almost any acid, it exhales a smell of hydro-sulphurous acid; the aqueous solution is of a yellow colour; what is thrown down by acetate of lead is first red, and it afterwards becomes black."

Therapeutical Effects.—In large doses, sulphuret of potassium acts as a powerful narcotico-acrid poison, a few drachms producing death with convulsions and tetanic spasms. In small doses it operates as a general stimulant, and as such, is employed on the Continent in the advanced stages of hooping cough, in chronic rheumatism, in rebellious skin diseases, &c.; but in this country it is rarely used as an internal remedy. As a topical remedy it is applied dissolved in water in the form of lotion or bath, or made into an ointment with axunge, in chronic cutaneous diseases principally those of a scaly character, and in the obstinate eruptions which affect the scalp.

Dose and Mode of Administration.—For internal use, gr. iij. to gr. x. dissolved in some aromatic water and sweetened with syrup.—*Potassæ Sulphureti aqua*, D. (Washed sulphur, 1 part; water of caustic potash, 11 parts; boil for ten minutes and filter through paper, preserve the liquor in well closed vessels; its specific gravity is 1·117). This preparation is similar to that formed by dissolving sulphuret of potash in water, Dose, min. x. to f℥i. diluted with water.—*Balneum Sulphuratum*, Rayer. (Sulphuret of potassium, ℥iv; tepid water, cong. xxx.; dissolve in wooden vessels). This may be employed as a local or general bath in skin diseases.—*Unguentum Potassii Sulphureti*, Devergie. (Solution of sulphuret of potash, 12 parts; carbonate of potash, 8 parts; axunge, 30 parts; mix). For scabies and other cutaneous diseases.

Incompatibles.—The acids; and most metallic solutions.

In cases of poisoning with this substance, the best antidotes are solutions of chlorinated lime or chlorinated soda, with emollient drinks.

Rosmarinus, L. E. Rosmarinus officinalis, cacumina, D. *Rosemary. The tops of Rosmarinus officinalis.* A native of the South of Europe; belonging to the Natural family *Labiatæ* (*Lamiaceæ*, Lindley), and to the Linnæan class and order *Diandria Monogynia.*

Botanical Characters.—A shrub, 6-8 feet high; Leaves, evergreen, sessile, lanceolate, revolute at the edge, glabrous at the upper surface, tomentose beneath; Flowers, pale-blue, in small spikes at the extremities of the young branches.

Properties.—The dried tops have an aromatic agreeable odour, somewhat resembling peppermint, and a warm, pungent, bitter taste. These properties depend chiefly on volatile oil, of which a pound of the fresh plant yields about one drachm. This oil, *Oleum Rosmarini*, D. L. E., is obtained by the usual process of distillation; it is limpid and colourless, with the odour and taste of the herb in an intense degree. Its density

is 0·897 ; and its composition $C^{45}H^{38}O^2$, (Kane). Rosemary tops communicate their odour to boiling water, but more completely to spirit.

*Adulterations.*—Oil of rosemary is often adulterated with oil of turpentine ; the fraud may be detected by the odour when dropped on a heated spatula, or by its not being completely soluble in alcohol.

Therapeutical Effects.—Rosemary possesses the aromatic stimulant properties of the Labiate plants before described, and may be used for the same purposes. The oil is frequently added to stimulating liniments, principally on account of its odour.

Dose and Mode of Administration.—*Oleum Rosmarini,* D. L. E., min. ij. to min. v. dropped on sugar.—*Spiritus Rosmarini,* D. L. E. ("Fresh rosemary tops, ℔iss. ; proof spirit, cong. j.; distil with a medium heat, ℔v." D.—"Oil of rosemary, ʒij. ; rectified spirit, cong. j. ; water, Oj. ; mix, and with a slow fire distil a gallon," L.—"Rosemary, ℔ijss. ; proceed as for spirit of lavender," E.) Seldom used internally. Dose, min. x. to min. xx.

Sabadilla. *Cevadilla* (described in the division *Anthelmintics),* is a powerful stimulant, and as such is used in the form of tincture as an external application in chronic rheumatism and paralysis, and over the region of the heart in hysterical and nervous palpitations. The powder of the seeds is employed to destroy pediculi ; but its application is not unattended with danger, especially if the skin be broken. The active principle of cevadilla is *veratria,* as before mentioned, and it was principally as a means of affording that alkaloid, that it was introduced into the London and Edinburgh Pharmacopœias. The following are the processes directed to be followed :—

Veratria.—*Lond.*—"Cevadilla, bruised, ℔ij. ; rectified spirit, cong. iij. ; diluted sulphuric acid ; solution of ammonia ; purified animal charcoal ; and magnesia, of each, a sufficiency ; boil the cevadilla with a gallon of the spirit for an hour in a retort, to which a receiver is fitted. Pour off the liquor, and again boil what remains with another gallon of spirit, and the spirit recently distilled, and pour off the liquor ; and let it be done a third time. Press the cevadilla, and let the spirit distil from the mixed and strained liquors. Evaporate what remains to the proper consistence of an extract. Boil this three or more times in water, to which a little diluted sulphuric acid is added, and with a gentle heat evaporate the mixed liquors to the proper consistence of a syrup. To this when cold, put in the magnesia to saturation, frequently shaking them ; then press and wash. Let this be done two or three times ; then dry what remains, and digest with a gentle heat in spirit two or three times, and strain as often. Afterwards let the spirit distil. Boil the residue in water, to which a little sulphuric acid and animal charcoal are added, for a quarter of an hour, and strain. Lastly, the charcoal being thoroughly washed, evaporate the mixed liquors cautiously till they have the consistence of a syrup, and add to them as much ammonia as may be sufficient to throw down the Veratria. Wash and dry it." *Edin.*—"Take any convenient quantity of cevadilla ; pour boiling water over it in a covered vessel, and let it macerate for 24 hours ; remove the cevadilla, squeeze and dry it thoroughly with a gentle heat. Beat it now in a mortar, and separate the seeds from the capsules by brisk agitation in a deep narrow vessel. Grind the seeds in a coffee mill, and form them into a thick paste with rectified spirit. Pack this firmly in a percolator, and pass rectified spirit through it till the spirit ceases to be coloured. Concentrate the spirituous

solutions by distillation so long as no deposit forms; and pour the residuum, while hot, into 12 times its volume of cold water. Filter through calico, and wash the residuum on the filter so long as the washings precipitate with ammonia. Collect this precipitate on a filter, wash it slightly with cold water, and dry it, first by imbibition with filtering paper, and then in the vapour bath. A small additional quantity may be got by concentrating the filtered ammoniacal fluid, and allowing it to cool.—Veratria thus obtained is not pure, but sufficiently so for medical use. From this coloured substance it may be obtained white, but at considerable loss, by solution in very weak muriatic acid, decolorization with animal charcoal, and re-precipitation with ammonia."

Physical Properties.—Veratria is an uncrystallizable solid, pulverulent, as met with in commerce of a grayish-white colour, but it may be obtained perfectly white. It has an intensely acrid taste, and is said to be inodorous, but the smallest quantity applied to the lining membrane of the nostrils provokes violent sneezing.

Chemical Properties.—It is composed of $C^{34}$ $H^{21}N$ $O^{6}$. It is not volatile nor altered by exposure to the air; it fuses at 230°, and cools into a transparent yellowish mass. It reacts alkaline, is soluble in cold water, requires 1000 parts of boiling water for its solution, is sparingly soluble in ether, but very soluble in alcohol. It forms salts with the acids, of which the muriate and the sulphate are alone crystallizable.

*Adulterations.*—Veratria very commonly contains lime; the adulteration may be readily detected by heating a small quantity in a platinum spoon, when if it be pure, it will be completely dissipated.

Therapeutical Effects.—In large doses, veratria operates as a powerful irritant poison, causing inflammation of the stomach and intestines when swallowed, and if applied to the surface of the body producing much irritation. Its action in small or medicinal doses does not appear to be well understood, but it would seem to act as a general stimulant, increased action of the intestines, the kidneys, and the capillaries of the skin being in general produced by its administration. Its use in medicine has been hitherto confined to neuralgic diseases, for the treatment of which it was first introduced as an external application by Dr. Turnbull. But the experience of numerous physicians who have tried it on his recommendation, not coinciding with his extravagant praises of the remedy, it has fallen into disrepute.

Dose and Mode of Administration.—*Pulvis Sabadillæ*, gr. j. to gr. v.—*Tinctura Sabadillæ.* (Cevadilla seeds, freed from their capsules according to the directions of the *Edinburgh Pharmacopœia* for preparing *veratria*, and bruised, any quantity; rectified spirit as much as will cover them; macerate for ten days, express and filter). For external use as an embrocation.—*Extractum Sabadillæ.* (Evaporate the tincture with a gentle heat to a proper consistence). Dose, gr. $\frac{1}{8}$. to gr. $\frac{1}{4}$. gradually increased. This extract may be advantageously substituted for *veratria.*—*Veratria*, L. E. Dose, gr. 1-12th. increased very cautiously. For an embrocation, ʒi. of the alkaloid may be dissolved in fʒi. of rectified spirit.—*Unguentum Veratriæ*, Turnbull. (Veratria, ʒss.; olive oil, ʒj.; prepared lard, ʒi.; mix).—*Tinctura Veratriæ*, Magendie, (Veratria, gr. iv.; rectified spirit, fʒi.; mix). Dose, min. v. to min. xv.

In poisoning with veratria, the treatment is the same as in poisoning with Colchicum. (See page 77).

Scrophularia nodosa, folia, D.—*Figwort. Leaves of Scrophularia nodosa.* Indigenous; belonging to the Natural family *Scrophulariaceæ,* and to the Linnæan class and order *Didynamia Angiospermia.*

Botanical Characters.—Root, large, thick, knotty; Stem, obscurely 4-angled, 2-3 feet high; Leaves, heart-shaped, acute, glabrous; Flowers, greenish purple, in axillary and terminal panicles.

The leaves of this plant are only used in medicine for preparing the following ointment:—*Unguentum Scrophulariæ,* D. (Fresh leaves of scrophularia nodosa; prepared hog's lard, of each, ℔ij.; prepared mutton suet, ℔j.; boil the leaves in the fat until they become crisp, and then strain with expression). This ointment was introduced into the Pharmacopœia on the authority of the late Dr. Whitley Stokes, as a remedy for some of the forms of *Pemphigus,* and other chronic cutaneous diseases, but it has nearly fallen into disuse.

Serpentaria, L. E. Aristolochia serpentaria, radix, D. *Virginian snake-root. Root of Aristolochia serpentaria.* A native of North America; belonging to the Natural family *Aristolochiaceæ,* and to the Linnæan class and order *Gynandria Hexandria.*

Botanical Characters.—Stem, simple, flexuous, 8-10 inches high; Leaves, alternate, cordiform, acuminate, slightly pubescent; Flowers, solitary, reddish-brown.

Physical Properties.—As imported, serpentaria root consists of a tufted head with numerous attached radicles of a yellowish-brown colour externally, whitish within, with a short resinous fracture. The odour is aromatic, like that of valerian, and the taste warm and camphoraceous.

Chemical Properties.—It consists of volatile oil, soft resin, bitter extractive, gum, albumen, starch, and some salts. It yields its properties to water and to alcohol.

Therapeutical Effects.—Virginian snake-root although at one time in great repute, is seldom employed in the present day. It appears to act as a general stimulant, and as such was used in typhoid fevers, in intermittents, in gangrenous affections, in amenorhœa of the debilitated, &c. It is still very generally used in America.

Dose and Mode of Administration.—In powder, gr. x. to ʒss.—*Infusum Serpentariæ,* L. E. (Serpentaria, ʒss.; boiling (distilled, L.) water, Oj.; macerate (infuse, E.) for 4 hours in a (lightly, L.) covered vessel and strain). Dose, fʒi. to fʒij.—*Tinctura Serpentariæ* D. L. E. ("Serpentaria, bruised (and sliced, D.), ʒiij. (ʒiiiss., L.); proof spirit, *by measure* ℔ij. (Oij., L.); macerate for 7 (14, L.) days and filter,"

D. L.—"Serpentaria, in moderately fine powder, ℥iiiss.; cochineal, bruised, ℥i.; proof spirit, Oij.; proceed by percolation or digestion as for tincture of Cinchona," E.). Dose, f℥j. to f℥ij.

Incompatibles.—Acetate of lead; and nitrate of silver.

Sinapis alba, semina, D. *White mustard seed,* (described in the division *Emetics),* was at one time much employed as a stimulant in atonic forms of dyspepsia, but is very rarely used as such in the present day. It was taken in the dose of a dessert-spoonful three or four times a day, swallowed entire.

Sodæ chlorinatæ liquor, L.—*Solution of Chloride of Soda. Chlorinated Soda; Hypochlorite of Soda; Disinfecting liquor.*

Preparation.—"Carbonate of soda, ℔i.; distilled water, f℥xlviij.; chloride of sodium, ℥iv.; binoxide of manganese, ℥iij.; sulphuric acid, ℥iv.; dissolve the carbonate of soda in Oij. of water; then put the chloride of sodium and binoxide of manganese, rubbed to powder, into a retort; and add to them the sulphuric acid, previously mixed with f℥iij. of water and cooled. Apply heat to the retort, and pass the chlorine first through f℥v. of water, and afterwards into the solution of carbonate of soda above directed," L.

Physical Properties.—This solution is of a yellow colour, with a strong odour of chlorine, and a sharp astringent taste.

Chemical Properties.—Its precise composition has not been ascertained, but it is generally supposed to be a mixture of hypochlorite of soda, bicarbonate of soda, and chloride of sodium. Exposed to the air, chlorine escapes, and crystals of the carbonate of soda are gradually deposited. By evaporation with a gentle heat crystals are obtained, which by solution in water afford a liquid with the same properties. It bleaches vegetable colours, first acting as an alkali on them. This solution may be distinguished from solution of chlorinated lime by its not precipitating with the oxalates or carbonates.

Therapeutical Effects.—This solution agrees precisely in its properties with hypochlorite of lime, and is employed for the same purposes, (see page 288). For destroying noxious effluvia, it is to be preferred to that substance as the salt, *chloride of sodium,* which is left does not deliquesce; while chloride of calcium is very deliquescent. The dose for internal use is min. xx. to min. xxx. in a sufficiency of water which may be sweetened with syrup.

Sodæ murias, D. E. Sodii chloridum, L.—*Common salt. Chloride of sodium; Muriate of soda; (Impure commercial Chloride of sodium,* E.).

Preparation.—Chloride of sodium is an article of the Materia Medica in the three British Pharmacopœias. On the large scale it is procured by dissol-

ving and crystallizing rock-salt, or by evaporating sea water or the water of some mineral springs, in which it is contained in large quantities. The Edinburgh College has given a formula for purifying commercial salt :—*Sodæ murias purum*, E. "Take any convenient quantity of muriate of soda, dissolve it in boiling water ; filter the solution and boil it down over the fire, skimming off the crystals which form, wash the crystals quickly with cold water, and dry them."

Physical Properties.—Chloride of sodium crystallizes in transparent, colourless cubes ; it has an agreeable saline taste, but no odour. Its density is 2·557.

Chemical Properties.—It is composed of 1 eq. of sodium, and 1 of chlorine, (Na Cl). It contains no water of crystallization, but heated it decrepitates owing to some being mechanically lodged between the tables of the crystals. Exposed to a bright red heat it fuses, and at a white heat volatilizes unchanged. It is permanent in the air when quite pure ; it is equally soluble in cold and boiling water, requiring 2·7 parts of water for its solution. It is insoluble in absolute alcohol, but rectified spirit dissolves it slightly. It is neutral to test paper.

*Adulterations.*—As met with in this country, common salt does not contain any impurity which can interfere with its use for general or pharmaceutical purposes. Owing to the presence of chloride of magnesium, it is frequently slightly deliquescent. The tests for its impurity, as given by the Edinburgh College, are as follows :—"A solution is not precipitated by solution of carbonate of ammonia followed by solution of phosphate of soda. A solution of gr. ix. in distilled water, is not entirely precipitated by a solution of gr. xxvj. of nitrate of silver."

Therapeutical Effects.—Chloride of sodium taken internally in moderate quantities acts as a mild stimulant to the digestive organs, promoting the assimilation of the food ; on which account, as well as in consequence of its agreeable flavour, it is used generally by man in all parts of the world, as an adjunct to nearly every substance employed by him as an article of diet. It is also said to prove serviceable to the alimentary canal, inasmuch as it prevents the generation of intestinal worms, to which those who use little or no salt with their food are very subject. In somewhat larger doses it acts as a mild cathartic, forming a principal ingredient in many mineral waters, in which it augments the operation of the other laxative salts. It also proves emetic in doses of one or two ounces ; and in one instance, a pound of it taken at once has occasioned death with all the symptoms of irritant poisoning. Applied to the surface of the body, it acts as a local stimulant, producing rubefaction. Chloride of sodium is not much employed in medicine ; as an emetic, it may be administered in narcotic poisoning in the absence of other substances ; as a cathartic, it is not given alone, but is advantageously combined with the other saline cathartics, (see page 87) ; as an anthelmintic, a strong solution has been injected into the rectum to destroy ascarides ; as a general stimulant, it is used in some forms of dyspepsia, and in scrofulous and other glandular enlargements ; and as a topical agent it is added to both hot and cold baths, when they are intended to act as local stimulants. In America a saturated solution of common salt is employed with much success as a lotion in chronic granular ophthalmia. In cholera and some other diseases in which the saline

constituents of the blood are deficient, a solution consisting of ʒij. of the muriate, and ϑij. of carbonate of soda dissolved in fʒlx. of water, has been injected into the veins, but the results were not more successful than those which followed other methods of treatment.

Dose and Mode of Administration.—As a stimulant, gr. x. to ʒi. As an emetic, ʒi. to ʒij. dissolved in Oj. of water. For baths, ℔j. to ℔ij. may be added to from cong. iij. to cong. v. of either cold or warm water.

Incompatibles.—Nitrate of silver.

Staphisagria, L. E. Delphinium staphisagria, semina, D. *Stavesacre. Seeds of Delphinium staphisagria.* A native of the South of Europe; belonging to the Natural family *Ranunculaceæ*, and to the Linnæan class and order *Polyandria Trigynia.*

Botanical Characters.—Stem, cylindrical, branching, downy, about 2 feet high; Leaves, alternate, broad, palmated, smooth on the upper, downy on the under surface; Flowers, purple, in lax racemes.

Properties.—Stavesacre seeds are about the size of a small pea, irregularly triangular, compressed, dark brown; they have a faint unpleasant odour, and a very acrid bitter taste. Their acridity depends upon an uncrystallizable alkaloid, *delphinia*, which constitutes more than 8 per cent of the seed. They yield their active properties to boiling water, but more completely to alcohol or to vinegar.

Therapeutical Effects.—Stavesacre is a powerful irritant, at one time used in medicine as an emetic and anthelmintic, but employed at present only for the destruction of pediculi. An ointment prepared by mixing the powdered seeds with four times their weight of lard, or an infusion of the bruised seeds in vinegar may be used for this purpose. Delphinia has been recently employed by Dr. Turnbull of London, in rheumatic and neuralgic affections. The dose of it is from 1-12th to 1-4th of a grain frequently repeated.

In cases of poisoning with stavesacre or its alkaloid, the treatment is the same as in poisoning with Colchicum, (see page 77).

Sulphur (described in the division *Cathartics)*, in small doses frequently repeated, acts as a stimulant to the cutaneous vessels, and is therefore administered with much benefit in chronic diseases of the skin, particularly scabies, for which, however, it is more generally employed as an external application. The curative powers of sulphur in this disease appear to be specific, but it has been recently stated that it acts as a poison to a small insect *(Sarcoptes hominis* of Raspail), which has been discovered to exist in the pustules of itch, and by which it is believed by many, that the disease is produced. Whatever may be its *modus operandi*, sulphur is undoubtedly more generally successful in the cure of scabies than any other substance which has been hitherto employed. Sulphur is also used as an external application in many

other cutaneous eruptions, particularly in lepra and psoriasis, in which in the form of vapour, *sulphur-vapour-bath*, its use is productive of the best results. The dose of sulphur as a stimulant is from gr. x. to gr. xxx.; it may be given in the form of electuary made with treacle or with syrup. For external application either of the following ointments may be used.—*Unguentum Sulphuris*, D. L. E. ("Prepared lard, ℔iv. (℥iv. E.); sulphur, ℔j. (℥j. E.); rub the sulphur to fine powder, and mix well with lard," D. E.—"Sulphur, ℥iij.; lard, ℔ss.; oil of bergamot, min. xx.; mix," L.).—*Unguentum Sulphuris compositum*, L. (Sulphur, ℔ss.; white hellebore, powdered, ℥ij.; nitrate of potash, ʒi.; soft soap, ℔ss.; lard, ℔iss.; oil of bergamot, min. xxx.; mix). This latter ointment often proves very irritating.

Terebinthinæ oleum. *Oil of turpentine* (described in the division *Anthelmintics*), administered in small but frequently repeated doses, acts as a general stimulant to the system, and as such has been employed in the low stages of typhoid and common continued fevers, in chronic rheumatism, in neuralgia, in hemorrhages from the mucous surfaces dependant on an atonic state of the vessels, to facilitate the passage of biliary calculi, in sciatica, and to prevent the access of the fit in epilepsy. Its local stimulant powers have been already considered, (see page 200); but made into an ointment with three parts of prepared lard, it is one of the most useful applications that can be applied to the scalp in those forms of impetigo and eczema, which admit of the use of stimulant applications. The four following substances nearly allied to turpentine, and obtained from the same or nearly related coniferous trees, are employed as topical stimulants in the forms of ointments, plasters or cerates.

Resina, L. E. Pinus sylvestris, resina, D. *The residue of turpentine after the oil is distilled*, L.—*Residue of the distillation of the turpentines from various species of Pinus and Abies*, E.—*Resin of Pinus sylvestris*, D. Rosin or Resin, is met with in two forms, *Yellow resin (Resina flava)*, and *Brown resin* or *Colophony (Resina nigra seu Colophonium)*. The former is obtained when the application of heat is stopped before all the volatile oil is expelled from the pine turpentines; the latter when the process is continued until all the oil is distilled. Resin is a semitransparent, very brittle solid, varying in colour from pale yellow, to brownish-black. It has a faint turpentine odour, but is quite tasteless; it consists of two resins which have been named *Pinic* and *Sylvic acids*; the composition of both is the same, viz., $C^{40}H^{30}O^4$. In medicine, yellow resin is alone employed; it is used partly as a local stimulant, but principally to communicate a certain degree of consistency or adhesiveness to ointments, plasters, &c.—*Unguentum Resinæ albæ*, D. (Yellow wax, ℔j.; white resin, ℔ij.; prepared hog's-lard, ℔iv.; make an ointment, and strain through a sieve while hot).—*Ceratum Resinæ*, L. (Resin, and wax, of each, ℔j.; olive oil, f℥xvi.; melt the resin and wax together with a slow fire, then add the oil, and press the cerate while hot through a linen cloth).—*Unguentum Resinosum*, E.

(Resin, ℥v.; axunge, ℥viij.; bees'-wax, ℥ij.; melt them together with a gentle heat, and then stir the mixture briskly while it cools and concretes). These ointments, commonly known under the name of *Basilicon ointment*, are employed as stimulating applications to foul and indolent ulcers.

Pix liquida, D. L. E. *Tar. From various species of Pinus*, D., *and of Abies*, E.—*Prepared liquid resin of Pinus sylvestris*, L. Tar is prepared in the countries bordering on the Gulf of Bothnia, from various trees of the fir tribe, by a species of *destillatio per descensum*. The old wood and roots are closely packed into the upper part of a pit dug in the earth, in the bottom of which an iron pan is fixed; the timber is ignited and covered with sods of earth to prevent the escape of the volatile parts. The tar gradually exudes and flows into the iron pan, from whence it is conducted by a pipe into barrels, each of which holds 31½ gallons.

Tar is a thick, tenacious, opaque liquid, of a dark brown, almost black colour, with a strong peculiar odour, and a bitter disagreeable taste. It dries so slowly, even when exposed to the air, that it retains its liquid character for an almost indefinite period. It is composed of various resins, modified oil of turpentine, acetic acid, and water; it communicates both odour and taste to water which dissolves out its oil and acid; and it is soluble in alcohol, ether, and the fixed and volatile oils.

Tar was formerly used in medicine in chronic catarrhal complaints, and in the form of vapour its inhalation was highly recommended by Sir Alexander Crichton in phthisis. In the present day, however, it is only used as a local stimulant in chronic cutaneous diseases especially those which affect the scalp.—*Aqua Picis liquidæ*, D. (Tar, *by measure* ℔ij.; water, cong. j.; mix, stirring with a stick for a quarter of an hour; as soon as the tar has subsided, strain the liquor, and keep it in well closed jars). *Tar-water* was first introduced by Bishop Berkley as a remedy for diseases of the chest and of the kidneys; the dose was from Oj to Oij. daily. Its use is completely obsolete in the present day.—*Unguentum Picis liquidæ*, D. L. E. ("Tar; and mutton suet, of each, ℔ss. (℔j. L.); melt them together, and [strain through a sieve, D.], [press through a linen cloth, L.]" D. L.—"Tar, ℥v.; bees' wax, ℥ij.; melt the wax with a gentle heat, add the tar, and stir the mixture briskly as it concretes on cooling," E.) Tar ointment is often used with much benefit as a stimulant in chronic diseases of the scalp in children.

Pix nigra, L. Pix arida, E.—*The prepared solid resin of Pinus sylvestris*, L. *Pitch from various species of Pinus and Abies*, E. This is a black solid matter left after the oil, the acid, and water are expelled by heat from tar. It is only used externally, the ointment being employed for the same purposes as tar-ointment.—*Unguentum Picis nigræ*, L. (Black pitch; wax; and resin, of each, ℥ix.; olive oil, f℥xvj.; melt them together and press through a linen cloth).

Pix burgundica, D. E. Pix abietina, L. *The (prepared,* L.) *resin of Pinus abies*, D. L.—*Concrete resinous exudation, probably in a great measure from Abies excelsa*, E.—*Burgundy Pitch.* This substance is supposed by the London and Dublin Colleges to be procured by fusion and expression from common Frankincense, *Thus*, D. (*Abietis resina*, L.);

but as met with in the shops it is usually a mixture of common turpentine, resin, and palm oil. It is in soft masses of a pale yellow colour, with a terebinthinate odour and taste. It is only used externally as a topical stimulant.—*Emplastrum Picis*, L. E. ("Burgundy pitch, ℔ij.; resin of the spruce fir, ℔j.; resin; and wax, of each, ℥iv.; expressed oil of nutmegs, ℥i.; olive oil; and water, of each, f℥ij.; add first the resin of the spruce fir, then the oil of nutmegs, the olive oil, and the water, to the pitch, resin and wax melted together. Lastly, mix them all and boil down to a proper consistence," L.—"Burgundy pitch, ℔iss.; resin; and bees'-wax, of each, ℥ij.; oil of mace, ℥ss.; olive oil, f℥i.; water, f℥i.; liquefy the pitch, resin, and wax, with a gentle heat, add the other articles, mix them well together, and boil till the mixture acquires the proper consistence," E.). A stimulating plaster applied to the chest in chronic catarrhal complaints, and over the seat of the pain in local neuralgia and in chronic rheumatism.

Veratrum album. *White Hellebore* (described in the division *Errhines*), is a powerful stimulant, causing irritation and even inflammation of the stomach, when taken in not very large doses. It was at one time much used in nervous affections, and in chronic cutaneous diseases both externally and internally; its employment in gout has been replaced by colchicum; and its application for the destruction of pediculi by staves-acre; so that at present it is scarcely ever put to any use; the dose of the powder is from gr. ij. to gr. v. cautiously increased.—*Vinum Veratri*, L. (White hellebore, sliced, ℥viij.; sherry wine, Oij.; macerate for 14 days and strain). Dose, min. v. to min. x.—*Decoctum Veratri*, D. L. (White hellebore, bruised. ℥j. (℥x. L.); water (distilled, L.), *by measure* ℔ij. (Oij. L.); rectified spirit, f℥ij. (f℥iij. L.); boil the hellebore in the water down to ℔j. *by measure* (Oj. L.), and when it has cooled add the spirit; "then press and strain," L.). Only employed externally in chronic cutaneous diseases particularly those of the scalp, and to destroy pediculi.—*Unguentum Veratri*, D. L. (White hellebore, powdered, ℥iij. (℥ij. L.); prepared lard, ℔j. (℔ss. L.); (oil of lemons, min. xx. L.); make into an ointment). Used for the same purposes as the decoction, and as a substitute for sulphur ointment in the cure of scabies. In poisoning with white hellebore, the same treatment should be used as in poisoning with Colchicum, (see page 77).

Vinum album hispanum, D. Vinum Xericum, L. Vinum album, E. *Spanish white wine. Sherry.* It would be quite foreign to the scope of this work to enter into any detailed account of the mode of preparation, or peculiar properties of the almost innumerable varieties of wine that are met with. The observations to be made, will therefore refer to wines generally.

Properties.—Wine is a transparent liquid, of a yellowish, reddish-yellow, or deep red colour. It has a peculiar, agreeable odour (*bouquet*), and taste, (both odour and taste vary exceedingly). It consists of water,

alcohol, tartaric and acetic acids, bitartrate of potash, tartrate of lime, extractive matter, colouring matter, vegeto-animal matter, and a peculiar volatile oil or rather ether, which has been named œnanthic ether. In the white wines, tannin and colouring matter are in less proportion than in the red wines. The quantity of alcohol which is present in wine varies exceedingly, some of the weaker German wines containing only 6·90 per cent by weight of alcohol, while strong Port wine contains 17·10 per cent, (Christison).

*Adulterations.*—The only adulterations of wine, which are of importance with reference to its medicinal employment, are the additions of lead or of lime which are sometimes used for the purpose of correcting acescency. The former is detected by the black precipitate which is produced on the addition of sulphuretted-hydrogen. The latter by the white precipitate formed with solution of oxalate of ammonia

Therapeutical Effects.—Wine is an excellent stimulant in the advanced stages of typhoid fevers, being generally better suited for this purpose than any other alcoholic liquid. Its use is particularly called for, where delirium is present with much sinking of the vital powers, and when the nervous symptoms as singultus, subsultus tendinum, and sleeplessness unaccompanied by any local inflammation or congestion, predominate. The use of wine in fever is not contraindicated, as has been stated by many, when the tongue is dry, black, or red, when the eyes are red or suffused, or when there is morbid heat of the surface; as wine often proves of great benefit when one or even more of these symptoms are present. Wine is also given with much advantage in convalescence from acute diseases, in chronic debility, especially when it is caused by excessive discharges, in mortification unaccompanied by inflammatory symptoms, and in tetanus. When any local congestion or inflammation is present or may be apprehended, the administration of wine in the treatment of disease is for the most part calculated to do mischief. Although Sherry is the only wine officinal in the pharmacopœias, Port is generally employed in medicine; Claret and Madeira are also used. When its greater strength and its astringency are not objectionable, Port wine is always to be preferred. Madeira and Claret are often inadmissible on account of their acidity; but when this is not the case, the former is well adapted for debilitated or broken down habits; the latter when the employment of stronger wines might prove injurious. Sherry is chiefly employed in the preparation of the medicated wines, but Cape wine, on account of its cheapness, is usually substituted by druggists; in a dietetical point of view, Sherry is the wine in most general use, and the one calculated to agree best with most constitutions.

Dose and Mode of Administration.—The quantity of wine which should be administered in the treatment of disease varies so exceedingly in different cases, that it is almost impossible to lay down any general rule. From f℥viij. to f℥xx., is the quantity usually given in the 24 hours, and it should be borne in mind that there is a great tolerance of wine in disease. As an injection for the radical cure of hydrocele, two-thirds of Port wine are diluted with one-third of water.

Zingiber, L. E. Amomum zingiber, radix, D.—*Ginger. Root of Amomum zingiber,* D. *Rhizome of Zingiber officinale,* L. E. Supposed to be originally a native of the East Indies, at present cultivated in most tropical countries. It belongs to the Natural family *Zingiberaceæ,* and to the Linnæan class and order *Monandria Monogynia.*

Botanical Characters.—Stem, annual, two to three feet high, cylindrical, invested with the smooth sheaths of the leaves; Leaves, linear-lanceolate, smooth; Flowers, yellowish with purple lips, in cone-shaped, radical or rarely terminal, solitary spikes; Fruit, a 3-celled capsule.

Preparation.—The rhizome or root-stalk, which is biennial, is dug up at the commencement of the second year of its growth, cleaned, scalded with boiling water, and dried in the sun, when it constitutes what is called black ginger; to prepare white ginger, the rhizome is not scalded, but the outer coats are removed by scraping.

Physical Properties.—As met with in commerce, ginger is in various sized, flattened pieces, knotty, palmated, hard and compact. *Black ginger* is of a dirty gray colour, and rugose externally, yellowish brown and stringy within. *White ginger* is whitish or pale yellow externally, pale buff within, with a somewhat starchy texture. The finer sorts of ginger are firm, sound and heavy, and have a peculiar, rich, aromatic odour, and a warm very pungent taste.

Chemical Properties.—Ginger contains a pale yellow volatile oil, an acrid soft resin, a sub-resin, gum, starch, extractive, nitrogenous matter, &c. Its properties which depend chiefly on the volatile oil and soft resin, are extracted by water and by alcohol.

Therapeutical Effects.—Ginger is a powerful aromatic stimulant; when taken in moderation it increases remarkably the tone of the digestive organs, and consequently is much employed as a condiment. In medicine it is principally used to give warmth and flavour to other drugs. Ginger acts as a special stimulant to the urino-genital mucous membrane, its use should therefore be avoided by persons who have any tendency to stricture of the urethra. As a local stimulant it is chewed in paralysis of the tongue, relaxation of the uvula, &c.; the powder made into a paste with boiling water and spread on linen is a speedy rubefacient.

Dose and Mode of Administration.—In powder, gr. v. to gr. xxx.—*Syrupus Zingiberis,* D. L. E. (Ginger, bruised (sliced, L.), ℥iv. (℥iiss. L. E.); boiling water, *by measure* ℔biij. (Oj. L. E.); pure sugar, ℥lxxxvij. (℔iiss. L. E.); macerate (infuse, E.) the ginger in the water for 24 (4, L. E.) hours, strain, add the sugar and make into a syrup). Dose, f℥i. to f℥ss. The syrup may be prepared extemporaneously by adding f℥i of the tincture to f℥x. of simple syrup.—*Tinctura Zingiberis,* D. L. E. (Ginger, in coarse powder (sliced, L.), ℥iiss.; rectified spirit, *by measure* ℔bij. (Oij. L. E.); macerate for 7 (14, L.) days and filter. "Proceed by percolation or digestion as for tincture of cinchona," E.). Dose, f℥i. to f℥ij.—*Essence of Ginger* commonly kept in the shops, is nothing more than a very strong tincture.

# CHAPTER XX.

## SPECIAL STIMULANTS.

In this division of medicinal agents, I include those substances which by a *special* or peculiar action on individual organs, or on the system generally, produce remediate effects. Many of them give rise to some alteration, which is not well understood, in the nature or quality of vital action, when they are called *alteratives;* while others possess a special influence in the treatment of certain diseases, when they are denominated *specifics*. Many alteratives and specifics have been already described in other classes of medicines, but the articles contained in this chapter cannot, with a regard to accuracy in arrangement, be included in any of them; inasmuch as the nature of the primary influence which some of them exercise on the animal economy has not been satisfactorily ascertained; and others possess a peculiar influence over *certain organs* or *diseases* merely:—as examples of the former we may refer to Mercury, Iodine, and Gold; of the latter to Nux-vomica, Cubebs, and Copaiba.

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### Ammoniæ arsenias. *Arseniate of ammonia.*

Preparation.—This compound is readily prepared by saturating a solution of arsenic acid with ammonia, taking care that the alkali be in excess, evaporating and crystallizing.

Properties.—It crystallizes in rhomboidal prisms; its composition being, $2\ H^3N\ As^2O^5 + HO$. It is a neutral salt, and is soluble in water and in alcohol.

Therapeutical Effects.—Arseniate of ammonia is not employed in this country. It is used in France as an internal remedy in the treatment of obstinate cutaneous diseases, particularly those of a scaly character. The preparation that is employed, being the following solution first proposed by Biett:—*Solution of Arseniate of Ammonia*, (Arseniate of ammonia, gr. iss.; distilled water, f℥iij.; spirit of angelica, f℥vi.; mix). Dose, f℥i. to f℥iij. in some aromatic water.

ARSENICI IODIDUM.—*Iodide of Arsenic. Teriodide of Arsenic.*

PREPARATION.—Arsenic, in fine powder, 3 parts; iodine, 10 parts; water, 100 parts; digest together so long as the odour of iodine is perceived, and evaporate quickly to dryness.

PROPERTIES.—This is an orange-red powder, odourless and tasteless. Exposed to the air it rapidly undergoes decomposition, iodine escaping and metallic arsenic being left; it is volatilized by heat. Iodide of arsenic is soluble in boiling alcohol, from which, as the alcohol cools, it is deposited in bright crystals. It is decomposed by water into free iodine, hydriodic and arsenious acids. Its composition is $AsI^3$.

*Adulterations.*—As met with in the shops, this preparation frequently contains uncombined metallic arsenic, which may be distinguished by the naked eye.

THERAPEUTICAL EFFECTS.—Iodide of arsenic is employed internally with much benefit in the treatment of chronic cutaneous diseases, particularly lepra and psoriasis; in the latter of which I have used it extensively, and with great success even in very inveterate cases, after many other remedies had been tried in vain. Its use must be continued for some time after the disease is cured, in order to prevent a relapse. In some cases in which the medicine had been taken daily for five or six weeks, the patients complained of head-ache and dryness of the mouth and fauces, which quickly disappeared on intermitting the use of the remedy for a few days. It is administered with much benefit in the treatment of cancer, and, in conjunction with the use of an ointment containing iodide of lead as an external application, has produced excellent effects in the hands of many practitioners. On the Continent it has been also employed as a topical application in the form of ointment, but its external use is not unattended with danger.

DOSE AND MODE OF ADMINISTRATION.—It should be at first given in doses of 1-10th of a grain, which may be cautiously increased to $\frac{1}{4}$th of a grain three times a day. It is best administered in the form of pill made with conserve of roses, or with hard manna.

INCOMPATIBLES.—Acids; acidulous, and metallic salts.

ARSENICI ET HYDRARGYRI HYDRIODATIS LIQUOR, DONOVAN. *Liquor of Hydriodate of Arsenic and Mercury.*

PREPARATION.—"Triturate 6·08 grains of finely levigated metallic arsenic, 14·82 grains of mercury, and 49·00 grains of iodine with f℥i. of alcohol, until the mass has become dry, and from being deep brown has become pale red. Pour on f℥viij. of distilled water; and after trituration for a few moments transfer the whole to a flask; add ℥ss. of hydriodic acid prepared by the acidification of gr. ij. of iodine, and boil for a few moments. When the solution is cold, if there be any deficiency of the original f℥viij. make it up exactly to that measure with distilled water. Finally filter," DONOVAN.

PROPERTIES.—This solution is of a pale greenish-yellow colour, odourless, with rather a styptic taste. Each f℥i. contains $\frac{1}{8}$th of a grain of oxide of arsenic, $\frac{1}{4}$th of a grain of oxide of mercury, and $\frac{3}{4}$ths of a grain of iodine in the state of hydriodic acid in chemical combination.

Therapeutical Effects.—This compound has been found particularly useful in the treatment of chronic cutaneous diseases, especially those of a scaly character, or in which the scalp is the seat of the disease. It has been also employed with benefit in venereal eruptions, both papular and scaly, in lupus, in impetigo, in pityriasis, &c. Its efficacy in these obstinate affections is now well established, and there are few cases, even of the most chronic character, which will resist its steady administration. For further information on this subject, I must refer to Mr. Donovan's excellent memoirs in the 16th, 18th, and 22nd Vols. of the *Dublin Journal of Medical Science.*

Dose and Mode of Administration.—Min. x. to min. xxx. three times a day. It should be administered largely diluted with distilled water. The external use of the medicine in the form of lotion (ʒi. to fʒi. of distilled water) is advantageously combined with its internal administration.

Incompatibles.—Acids; most salts; opium; and the salts of morphia.

Aurum.—*Gold.* This metal is not contained in any of the British Pharmacopœias, nor are any of its preparations employed in this country in the practice of medicine. They are, however, frequently administered on the Continent, and their virtues highly spoken of in some diseases. Although it has been stated by many that metallic gold is perfectly inert, a powder of gold *(Pulvis auri)* is officinal in the Parisian Codex. It is prepared in several ways: one of the simplest and best, is to rub any quantity of leaf-gold with 7 or 8 times its weight of sulphate of potash in an earthenware or glass mortar, as long as any fragments of the leaves are visible; washing well with warm water, which dissolves out the sulphate of potash, and leaves the gold in the form of a fine powder. Powder of gold is said to be a much more effectual remedy both in primary and secondary syphilis than mercury; it is peculiarly applicable to those cases in which mercury is found to aggravate the disease, or in which the symptoms depend on the excessive use of preparations of that metal; in some instances it produces increased flow of saliva, without affecting the teeth and gums however as that metal does. It has been also used in chronic cutaneous diseases, in scrofulous affections, and in glandular enlargements. Powder of gold may be given internally in doses of gr. ¼ or gr. ½ gradually increased to gr. iij.; it may be made into pill with conserve of roses. It is, however, generally introduced into the system by way of friction on the gums and tongue, or applied on a portion of the skin, deprived of the epidermis; it is also used as a local application to chancres in their primary stage. For these purposes either of the following preparations may be employed. *Syrup of Gold;* (Powder of gold, gr. xxiv.; simple syrup, fʒi.; mix).—*Ointment of Gold;* (Powder of gold, gr. j.; axunge, gr. xv).

Auri iodidum.—*Iodide of Gold.*

Preparation.—(Fr. Cod.). "Pour a solution of chloride of gold into a

solution of hydriodate of potash, as long as any precipitate falls; filter, and wash the powder well with alcohol, to dissolve out the excess of iodine; and then dry it."

Properties.—Iodide of gold is a greenish-yellow powder, insoluble in cold, and very sparingly soluble in boiling water. Exposed to a heat of about 300° F. the iodine is driven off, and metallic gold left. It is composed of 2 eq. of gold and 1 of iodine, $Au^2I$, (Graham).

Therapeutical Effects.—This preparation is a very active poison, more so than corrosive sublimate; it is employed in venereal and scrofulous affections internally, in doses of 1-15th to 1-10th of a grain, in the form of powder, or of pill, combined with powdered gum arabic as it is decomposed by most vegetable substances.

Auri perchloridum.—*Perchloride of Gold. Sesquichloride of Gold.*

Preparation.—(Fr. Cod.). "Pure laminated gold; and nitric acid, of each, one part; muriatic acid, two parts; dissolve the gold in the mixed acids with a gentle heat, evaporate till the solution begins to emit chlorine; and set it aside to crystallize by cooling."

Properties.—Sesquichloride of gold is in the form of needle-shaped, prismatic crystals, of a golden-yellow colour; it is inodorous, but has a very styptic, disagreeable taste. In dry air it remains unaltered, but deliquesces rapidly in damp air. Water, alcohol and ether dissolve this salt; the solution is of a yellow colour; and is acid to litmus paper; exposed to the light although kept in stoppered bottles, it is decomposed, and gold deposited on its surface. Sesquichloride of gold is composed of 2 eq. of gold, and 3 of chlorine, $Au^2\ Cl^3$ (Graham).

Therapeutical Effects.—This salt is the most generally employed of the preparations of gold. It is exceedingly active; so small a dose as 1-15th of a grain has, in the hands of Cullerier, at the second dose produced gastric irritation, dryness of the tongue, redness of the throat, colic, and diarrhœa. It is employed it is said with much success in the treatment of syphilitic diseases, both primary and secondary, particularly in cases where mercurial preparations fail to do good. It has also been used in scrofulous and herpetic affections, in cancer, &c. As an external application, it has been employed as a caustic to open cancer, to lupus, and to obstinate syphilitic ulcerations.

Dose and Mode of Administration.—It may be given in doses of 1-20th to 1-15th of a grain, once a day, made into pills with starch, or dissolved in distilled water. The same quantity intimately mixed with gr. v. of starch may be applied by friction to the gums and tongue.—*Caustic of Recamier;* (Chloride of gold, gr. vj.; dilute nitro-hydrochloric acid, ℥i.; dissolve). Applied by means of a piece of lint dipped in it; the eschar which it forms falls off in a few days, and leaves a clean, healthy surface underneath.—*Sodii Auro-terchloridum,* Fr. Cod. (Chloride of gold, 85 parts; chloride of sodium, 16 parts; dissolve in a small quantity of distilled water; concentrate with a gentle heat, till

a pellicle begins to form on the surface; then set aside to crystallize). Chloride of gold and sodium crystallizes in long four-sided prisms, of an orange-yellow colour; it is employed in the same manner, and in the same doses as sesquichloride of gold. It is less expensive, and nearly, if not quite as active. An ointment of it, prepared by mixing, with trituration, 1-10th of a grain with gr. xxxvj. of axunge, may be applied to the skin denuded of the epidermis.

Incompatibles.—Most metals, and their salts; the alkalies; sugar; gum; charcoal; tannin; extractive.

In poisoning with chloride of gold, or with chloride of gold and sodium, the same treatment should be adopted as in poisoning with corrosive sublimate.

Auri peroxydum.—*Peroxide of Gold. Sesquioxide of Gold. Auric Acid.*

Preparation.—(Fr. Cod.). "Chloride of gold, 1 part; calcined magnesia, 4 parts; water, 40 parts; boil gently for a short time; wash the precipitate repeatedly with water until the washings no longer precipitate with solution of nitrate of silver; and then digest in cold diluted nitric acid, to dissolve out the magnesia; dry the residuum without heat and in the dark."

Properties.—Auric acid is of a chestnut brown colour, becoming yellowish when moistened. It is insoluble in water; is rapidly decomposed by exposure to light or heat; and combines with alkalies to form salts. It is composed of 2 eq. of gold, and 3 of oxygen, $Au^2$ $O^3$ (Berzelius).

Therapeutical Effects.—It is used in the same cases as the other preparations of this metal. Dose, 1-10th of a grain to 1-4th of a grain.—*Pills of oxide of Gold,* Magendie, (Oxide of gold, gr. vj.; extract of mezereon, 3ij.; divide into 60 pills). Dose, ij. to x. daily.

Bromineum, L.—*Bromine.* This elementary fluid body was originally introduced into the London Pharmacopœia, merely as being employed in the preparation of *Bromide of potassium.* But within the last few years it has been used in medicine as a substitute for iodine, in consequence of the high price of that substance.

Preparation.—It is obtained from sea water, and from the waters of many mineral springs, in which it exists in the forms of bromide of magnesium and bromide of sodium, by first saturating with chlorine gas to separate it from the base, adding ether which dissolves out the bromine, and then separating from the ether by means of solution of caustic potash which combines with the bromine forming bromide of potassium; from this salt it is obtained by a process similar to that for procuring iodine. It has been latterly prepared in large quantities in the United States, having been discovered in many of the brine springs throughout the State of New York by Mr. O'Reilly of this city.

Physical Properties.—At ordinary temperatures, bromine is a heavy,

dark reddish-brown liquid, of a hyacinth-red colour when viewed by transmitted light. Its odour resembles that of chlorine but is much stronger and more disagreeable, whence its name (Βρῶμος, fetid). Its taste is very acrid. Sp. gr. 2·966.

Chemical Properties.—Bromine is an elementary substance. It is scarcely soluble in water, and its solubility is not sensibly augmented by heat. It is rather more soluble in alcohol and still more so in ether. It is very volatile, boiling at the temperature of 114° F. Bromine bleaches vegetable colours like chlorine. It combines with most metals, forming bromides with them.

Therapeutical Effects.—As remarked above it is as a substitute for iodine that bromine is employed in medicine; with which it appears to be nearly if not quite identical in action.

Dose and Mode of Administration.—It is seldom used in the uncombined state, but the following solution has been employed by M. Pourche as a substitute for tincture of iodine:—Bromine, one part; distilled water, forty parts; dissolve. Dose, min. v. to min. vj. in some aqueous vehicle three or four times a day. For external use a preparation four times the strength of this may be employed. The *bromide of potassium* and *bromide of iron* will be described hereafter. The other combinations of bromine which are used in medicine are the following:—*Bromide of barium,* which is soluble in water, is given in doses of one to five grains three times a day: the ointment is prepared by combining it in the proportion of one part to ten of lard. *Bromide of calcium* is prescribed in the form of pill made with conserve of roses; the dose of it is from three to ten grains. Two *bromides of mercury* have been used: the first, a sub-bromide, is a white insoluble powder; the dose of it, is one to two grains daily: the second, a bromide, is fusible and volatile, and soluble both in water and alcohol; its dose is 1-16th of a grain, gradually increased to 1-4th of a grain, daily.

Copaiba, L. E. Copaifera officinalis, resina liquida, D. *Copaiva. Balsam of Copaiva. Fluid resinous exudation of various species of Copaifera,* E.—*of Copaifera officinalis,* D.—*of Copaifera langsdorfii,* L. The various species of the genus Copaifera from which the balsam is obtained are natives of South America, and the West Indian Islands; they belong to the Natural family *Leguminosæ (Fabaceæ,* Lindley), and to the Linnæan class and order *Decandria Monogynia.*

Botanical Characters.—Trees, 20–35 feet high; Leaves, abruptly pinnate; Leaflets, coriaceous, somewhat unequal, ovate; Flowers, in panicles.

Preparation.—The liquid resin exists in great abundance in the trees; it is procured by making deep incisions into the stem in the hot summer months, when in some instances 12 pounds of juice will exude in three hours. Many trees yield copaiva twice or three times in the year.

Physical Properties.—*Copaiva,* or as it is commonly but improperly called *Balsam of Copaiva,* is a transparent, oily liquid, of a pale-yellow colour, (inferior kinds are dark yellow). It has a strong, peculiar, and

to most persons very disagreeable odour, and a bitter, acrid, very permanent and exceedingly unpleasant taste. Sp. gr. from ·950 to ·966, becoming denser by age.

Chemical Properties.—Fresh copaiva is composed of 41 per cent of volatile oil, 51·38 per cent of hard yellow resin *(copahuvic acid)*, 2·18 of brown soft resin, and 5·44 of water and loss (Gerber). Exposed to the air it gradually thickens, and becomes darker coloured. It is insoluble in water, but completely soluble in alcohol, ether, and the fixed and volatile oils. It dissolves magnesia and its carbonate, and forms with them after 4 or 5 hours a translucent mass, sufficiently consistent to form into pills. The volatile oil of copaiva *(copaibæ oleum)*, which is officinal in the *Edinburgh Pharmacopœia*, is obtained by distillation with water. It is transparent and colourless, has a density of 0·878, boils at 473°, and is soluble in alcohol and ether. Its composition is isomeric with that of oil of turpentine, being $C^5H^4$. *Copahuvic acid* is composed of $C^{40}H^{32}O^4$; it is left when the volatile oil is distilled; in consequence of its retaining a small portion of which, it possesses a faint copaiva odour.

*Adulterations.*—Copaiva is very much adulterated, so much so that it is difficult to meet with a perfectly pure specimen. The impurities usually found in it are oil of turpentine, or some fixed oil as castor-oil, poppy-seed oil, rape-oil, &c. Oil of turpentine is readily discovered by the odour, when it is dropped on a heated spatula. The presence of any fixed oil may be detected by the greasy areola which surrounds the spot of resin left, on gently evaporating over the flame of a lamp, a drop or two of the suspected balsam on unsized paper. The tests of the *Edinburgh Pharmacopœia* for its purity are as follows:—"Transparent; free of turpentine odour when heated; soluble in two parts of alcohol; it dissolves a fourth of its weight of carbonate of magnesia, with the aid of a gentle heat, and continues translucent." To these we may add the most satisfactory test for the usual adulteration, that with castor-oil, as proposed by Planche; "pure balsam agitated with solution of ammonia, of the density ·965, becomes clear and transparent in a few moments; but remains turbid if castor-oil be present." These tests are, however, not to be depended on; the only satisfactory means of ascertaining the goodness of copaiva, as has been lately suggested by Mr. Redwood, being, the obtaining the oil by distillation:—pure specimens yield nearly 60 per cent, while those of inferior quality do not afford more than 30.

Therapeutical Effects.—Copaiva is a special stimulant to the mucous membranes, its action being particularly directed to the bladder and urethra. In many instances its administration is followed by a cutaneous eruption which closely resembles urticaria; and when given in large doses it produces vomiting and purging. The principal use of copaiva is in the treatment of gonorrhœa, for which it is undoubtedly the best remedy with which we are acquainted. The practice is still followed by many, of not administering copaiva in this disease, until all inflammatory symptoms are subdued by antiphlogistic treatment. But the majority of surgeons in the present day administer it in the very earliest stage, and with the best results; indeed the earlier it is given, the more speedy and the more effectual will be the cure. In the treatment of gonorrhœa, the use of copaiva should be always continued for 8 or 10

days after the discharge has completely ceased. Copaiva has been also employed with benefit in leucorrhœa, in chronic catarrh of the bladder, in the chronic bronchitis of the old or debilitated especially when the bronchial secretion is profuse, and in chronic dysentery.

Dose and Mode of Administration.—Min. x. to f3i. In consequence of its very nauseous taste, a great many ways have been proposed for administering copaiva; but it appears to me to act with greater certainty, and to cause less disgust when given floating on a wine-glassful of water to which a drachm of some aromatic tincture, as of tincture of orange peel, has been added. It is sometimes given in the form of pill prepared by boiling the balsam with calcined magnesia or with hydrate of lime; a sufficient degree of consistency will be obtained in 4 or 5 hours with the latter, while from 12 to 15 hours will be required to produce the same result with the former. The process of M. Thierry is as follows:—Rub together in a marble mortar 15 parts of *pure* copaiva, and 1 part of hydrate of lime, (or 2 parts of calcined magnesia); put the mixture over a water bath, and stir from time to time till the lime has disappeared; keep up the fire for 4 hours, or for 15 hours if magnesia be used. The mass may be divided into gr. vj. pills, of which from 6 to 12 may be taken two or three times daily. More recently copaiva has been administered enclosed in gelatine capsules, for preparing which, the following method is followed:—the polished bulbous extremities of iron rods are oiled with almond oil, and then dipped into a warm concentrated aqueous solution of ordinary or bleached gelatine, which is of the consistence of thick honey; they are then rotated quickly till the gelatine congeals, when the capsules are to be removed gently with three fingers, and laid on a loose hair-sieve to dry; when perfectly dry they are filled to the margin by means of a glass drop tube with copaiva, and the mouth closed with a little of the warm solution of gelatine *(Steege)*. *Gelatine capsules of copaiva* contain each about gr. x. of balsam. The nostrum known as *Franks's specific solution* may be very closely imitated as follows: Copaiva, 2 parts; liquor potassæ, 3 parts; distilled water, 7 parts; boil for a quarter of an hour, then add, spirit of nitric ether, 1 part; allow it to stand a few hours, and draw off the clear liquid by means of an orifice in the lower part of the vessel. The dose of this mixture is f3ij. three times a day.—*Oleum Copaibæ*, E. The oil is preferred by many to any other preparation of copaiva, but I have frequently seen it fail; the dose is from min. xv. to min. xxx. dropped on sugar.—*Resina Copaibæ;* this preparation is very properly discarded from practice; the dose of it is from gr. x. to 3ss.

Cubeba, D. E. Piper cubeba, L.—*Cubebs. Fruit of Piper cubeba (Cubeba officinalis).* A native of Java and the Prince of Wales's Island; belonging to the Natural family *Piperaceæ*, and to the Linnæan class and order *Diandria Trigynia.*

Botanical Characters.—Stem, sarmentaceous, articulated, terete; Leaves, petiolated, oval, coriaceous; Flowers, on an elongated, pendant spadix; Fruit, a pedunculated small berry, the peduncles are nearly equal to the petiole.

Physical Properties.—Cubebs are the dried unripe berries; they are about the size of black pepper, wrinkled on the surface, brownish externally, whitish and oily within. They have a small portion of the peduncle attached, whence the name *piper caudatum* has been applied to them. Their odour is strong, peculiar, aromatic; their taste warm, pungent and very spicy.

Chemical Properties.—Cubebs are composed of 2·5 per cent of green volatile oil, 1 per cent of yellow volatile oil, 4·5 of a peculiar principle named *Cubebin* (which is probably identical with *Piperin*), 1·5 of balsamic resin and wax, lignin, &c. The volatile oil, *Oleum Cubebæ*, E., is obtained by the usual process of distillation with water; it is of a pale greenish yellow colour, transparent and limpid, with the peculiar odour and taste of cubebs. Its density is 0·929; and its composition $C^{15}$ $H^{12}$. Cubebs yield their properties very partially to boiling water, but completely to alcohol.

Therapeutical Effects.—Cubebs possess the stimulant and carminative properties of the other peppers; but they also exercise a specific influence on the urinary organs, indicated by their power in arresting urethral discharges. They are only employed in medicine in the treatment of gonorrhœa, for which they are held by many to be equal if not superior to copaiva. We are perfectly ignorant as to the manner in which cubebs cure gonorrhœa; but their specific influence appears to be exercised only in the early stages of the disease, so that they usually fail to prove beneficial when the discharge has existed for any time; they should be therefore administered on its first appearance, when if the running is not checked in from three to five days, their continued use will in most instances do more harm than good. Cubebs have been also employed in leucorrhœa and in catarrh of the bladder with doubtful benefit.

Dose and Mode of Administration.—In powder, which is the best form, ℈j. to ʒiij. three times a day. The powder should be always prepared fresh for use, as owing to the volatility of its oil, it deteriorates rapidly. The larger the dose in which cubebs are given, the more certain will be their effect; they may be administered suspended in milk or in water.—*Oleum Cubebæ*, E.; Dose, min. x. to min. xxx. dropped on sugar; it is not so certain in its effects as the powder.—*Tinctura Cubebæ*, D. L. (Cubebs, (bruised, L.), ʒiv. (ʒv. L.); proof (rectified, L.) spirit, ℔ij. (Oij. L.); macerate for 14 days and filter). This tincture is generally added to mixtures containing copaiva. Dose, f ʒi. to f ʒij.

Fucus vesiculosus, herba cum fructu, D. *Bladder-Wrack.* A very common sea-weed on our shores; belonging to the Natural family *Algaceæ* (*Fucaceæ*, Lindley), and to the Linnæan class and order *Cryptogamia Algæ*. This sea-weed contains *iodine*, and before the discovery of that substance, the expressed juice was given internally, and frictions of the plant applied externally in scrofulous and glandular enlargements. In the present day it is employed only as a domestic remedy in the form

of poultice to scrofulous swellings and ulcerations, in the treatment of which it often produces very beneficial effects.

Hydrargyrum, D. L E.—*Mercury. Quicksilver.* Mercury is met with in the metallic state in the quicksilver mines of south America. It is principally brought to England from Almaden in Spain, from Idria in Illyria, and from Moschel in Bavaria, where it is extracted from the native sulphuret, *Cinnabar.*

Preparation.—It is procured from cinnabar either by distilling with caustic lime or by roasting the ore. As met with in commerce, it is in general sufficiently pure for medical purposes, but in the *Dublin Pharmacopœia*, a process is contained for purifying it:—Hydrargyrum Purificatum, D., "Mercury, six parts; distil four parts with a gentle heat."

Physical Properties.—At ordinary temperatures, mercury is liquid; it has a silver-white colour with a bluish shade, and is very brilliant. Its sp. gr. is 13·99 when liquid, and 14·0 when solid.

Chemical Properties.—Mercury is a simple metallic substance, its symbol being Hg. It boils at 662°, and solidifies at 39° or 40° below zero, crystallizing in regular octohedrons; exposed to the air at the usual temperature, it remains unaltered if pure, but otherwise the surface soon tarnishes. Agitated for some time in contact with the air, it is converted into a greyish-black powder which was formerly called *Æthiops per se;* this according to some chemists is a suboxide of mercury, but according to others it is the metal in a state of very minute division. Mercury combines with most metals to form *amalgams;* the smallest trace of it communicates a white stain to gold or silver.

*Adulterations.*—Tests for the purity of metallic mercury are given by the London and Edinburgh Colleges.—"Totally dissipated in vapour by heat. Dissolved by diluted nitric acid; when boiled in hydrochloric acid, the acid when cold is not coloured, nor is anything precipitated from it by hydro-sulphuric acid. Its sp. gr. is 13·5," L.—"Entirely sublimed by heat; a globule moved along a sheet of paper leaves no trail; pure sulphuric acid agitated with it evaporates when heated without leaving any residuum," E. By the application of these tests, the usual metallic adulterations with tin, lead, zinc, or bismuth, are readily detected.

Therapeutical Effects.—As long as mercury remains in the state of metal, it is now generally agreed that it does not exercise any influence on the human body, and that in all cases in which its specific action is manifested, it must be first converted into oxides or salts. The inhalation of mercurial vapours, (which, as has been recently proved, contain some oxide), for any lengthened period, produces a singular train of symptoms which principally affect the nervous system; the most remarkable of these is the *shaking palsy* or *tremblement metallique,* in which the muscles of the arms become so unsteady, as almost to place them completely out of the control of the individual. This affection is not uncommon amongst the workers in quicksilver mines, gilders, and others whose

trade exposes them to the vapour of this metal. To cure the disease, the patient must be removed from the contaminated atmosphere which has produced it, and get nourishing diet, with tonics, more particularly preparations of iron. The shower-bath and magnetic electricity (see page 302), are powerful auxiliaries in restoring the nerves to a healthy state.

The effects of the different preparations of mercury which are used in medicine on the human body are very complex, and as they are possessed in common by most of the mercurial compounds, they will be most conveniently considered here.

The *topical* effects of the preparations of mercury are generally somewhat irritant, *remotely* they act as special stimulants both to secretion and excretion. The most remarkable effect of mercury is its action on the salivary glands, *salivation*. When this medicine is introduced into the system in such a manner as to excite this peculiar state, at first it produces increased vascular action, shortly followed by a metallic or brassy taste in the mouth, and a slight mercurial fetor of the breath; the gums become somewhat swollen and spongy at their edges, soon presenting a slight degree of ulceration; the lining membrane of the cheeks and sometimes also of the palate acquires a leaden hue, and is swollen; and an increased flow of saliva takes place, accompanied by pain in the teeth on the least pressure. If these symptoms be allowed to advance, or if more mercury be administered, the cheeks, the tongue, and the throat swell and ulcerate, and a copious flow of saliva sometimes amounting to several pints in the twenty-four hours, is induced; this excessive salivation is accompanied by slow fever and rapid emaciation. The quantity of a mercurial preparation required, or the length of time for which it must be administered, to produce the above effects, varies exceedingly in different constitutions and under different circumstances. Individuals are sometimes met with, in whom, almost the minutest dose of any preparation of mercury will produce most violent salivation; while on the other hand, some persons appear to be totally insensible to this peculiar operation of the drug.

It has been held by many that the production of this specific effect of mercury is necessary to the development of its curative powers, and most unquestionably it occurs, that this sanatory influence in the treatment of most diseases is contemporaneous with its action on the salivary glands. Great attention however must be always paid not to allow salivation to proceed too far, as a frightful train of symptoms, in many instances followed by death itself, is the usual result of excessive salivation. In the early stage, mercurialism is most decidedly checked by the use of active or nauseating doses of tartar emetic, and by keeping the surface of the body warm, and the face and neck cool.

The effects of mercury on the system, are sometimes accompanied by a peculiarly alarming state first described by Mr. Pearson, under the name of *mercurial erethism*; "it is characterised by great depression of strength, a sense of anxiety about the prœcordia, frequent sighing, trembling partial or universal, a small quick and sometimes intermitting pulse, occasional vomiting, a pale contracted countenance, a sense of coldness, but the tongue is seldom furred, nor are the vital or natural functions much disordered." When these or the greater part of these symptoms are

present, a sudden and violent exertion of the animal powers, such as rising suddenly in bed, will often prove fatal. These symptoms are best combated by an immediate discontinuance in the use of mercury, the exhibition of cordials in small but frequent doses, and rest in the horizontal posture with free exposure to the open air both by day and night.

The use of this mineral is also frequently attended with, or followed by several forms of diseases of the skin: of these the most important is *mercurial eczema*, which often occurs when only a very small quantity of a mercurial preparation has been taken. In its milder forms, it resembles the acute stage of *eczema rubrum*, arising from other causes; but it more frequently assumes a much more severe character, when it is ushered in by fever, difficult respiration, dry cough, and tightness across the chest, with a general smarting and burning feel of the skin over the whole body. These symptoms are soon followed by an eruption of minute vesicles, which break and discharge a very fetid fluid. As the disease increases in severity, the eruption extends over the face and the whole of the body, which become covered with incrustations; the fever assumes a typhoid type, the difficulty of breathing increases, and is accompanied by bloody expectoration, spots of purpura appear, and death ensues, preceded by delirium or convulsions. On the first appearance of this eruption, the use of mercury ought to be immediately relinquished, and the accompanying symptoms treated by the means appropriate for the individual case,—any account of which would be quite foreign to the scope of this work.

The therapeutical powers of mercury, and for which it is employed in the treatment of disease, depend on its properties as an *anti-phlogistic*, an *anti-syphilitic*, an *alterative*, and a *deobstruent*. An account of the most important diseases for which mercurials are administered is subjoined, but as they are so numerous they can be only very shortly alluded to. In *inflammatory diseases* both acute and chronic, mercury is very much employed; it is peculiarly adapted for those forms of inflammation which frequently result in the effusion of coagulable lymph or of serum; amongst which may be enumerated croup, laryngitis, bronchitis, pleuritis, pericarditis, peritonitis, (particularly that form of it which attacks lying-in-women), meningitis, &c. In all these diseases the previous use of blood-letting is attended with advantage, and the mercurial—calomel is the preparation generally used, should be introduced into the system as quickly as possible, so as just to touch the gums, but the production of free salivation usually proves injurious. In iritis, mercury is the chief remedy on which reliance is to be placed. In hepatitis, in pneumonia, in metritis, and in synovitis, its use is productive of decided benefit. In epidemic dysentery, and in pestilential cholera, especially when occurring in warm climates, very large doses of calomel given at the very onset of the disease, will frequently cut it short; as this power, however, is possessed by calomel alone, we shall again refer to it. In the fevers of our climate, unless when inflammation of some particular organ is present, the use of mercury is injudicious; but in the fevers of warm climates it is for the most part found to be serviceable. The curative powers of mercury in inflammatory diseases depend much on the character of the inflammation; thus, while it generally acts beneficially in simple acute

inflammations, and in those of a syphilitic character, it is less serviceable in rheumatic, and seldom admissible in scrofulous inflammation.

The history of the *syphilitic disease* is closely connected with mercury, as for many hundred years it was supposed to be completely incurable without the use of that medicine. Of late, however, it has been established on very satisfactory evidence that most, if not all, cases of syphilis may be cured without mercury, by simple local and general treatment. Nevertheless, when judiciously employed, so as to produce a moderate ptyalism, mercury has been found by the most experienced surgeons to cure the disease more rapidly, and to afford greater security against relapses.

In chronic enlargements of the abdominal viscera unconnected with malignant disease, in glandular swellings, in morbid depositions, in adhesions of parts consequent on inflammation, where hemorrhage has taken place into the substance of the brain or of the lungs, and for the removal of effusions into any of the shut cavities of the body, mercury, administered so as to produce its specific action, generally proves very efficacious. In paralysis, especially when dependant on derangements of the brain and nervous system, its use is often attended with decided benefit. In many other diseases of the nervous system as in hydrocephalus, in mania, in epilepsy, in chorea, in tetanus, in hysteria, in tic douloureux, &c., mercury has been also employed in many instances with advantage.

Dose and Mode of Administration.—To remove obstruction of the bowels, metallic mercury has been given in doses of one or two pounds, followed by active cathartics, but the absurdity of the principle on which it was administered, that of acting as a mechanical agent, is too manifest to require any observation. As before remarked, the specific action of mercury is not manifested so long as it retains the metallic state; but as there are some general rules which apply equally to the different mercurial preparations employed to produce salivation, they will be most conveniently considered in this place. And first, with respect to preparatory treatment: it will be always advisable, in acute inflammations, to subdue the severity of the symptoms by antiphlogistic measures; and in broken down or enfeebled constitutions, to strengthen the system by the use of tonics, previous to the administration of mercury. Owing to the neglect of these precautions, it frequently occurs that the physician is baffled in his attempts to produce ptyalism, or when produced it is excessive, and with great difficulty controlled. "I am strongly of opinion," says the late Mr. Colles in his valuable work on the Venereal Disease, "that the want of a due preparatory process has of late years contributed to bring this valuable remedy into much disrepute." With respect to the general treatment during a mercurial course, the most important points to be observed are, the necessity of rest and quietness of both mind and body, the maintaining the temperature of the surface uniform by warm clothing, and the use of a moderate diet, free from all stimulating food and drink.

In the following preparations, a portion of the mercury is converted into the sub-oxide, but the greater part of it is merely mechanically reduced to a finely divided state.—*Pilulæ Hydrargyri*, D. L. E. (See page 83). Dose, gr. iij. to gr. v., night and morning; if it should occasion irritation, a fourth of a grain of opium may be added to each

pill.—*Hydrargyrum cum Cretâ,* D. L. E. (See page 82). This is the mildest preparation of mercury; as an alterative the dose is from gr. v. to gr. xxx. It is seldom given with the intention of producing salivation, except in very weak or enfeebled habits.—*Hydrargyrum cum Magnesiâ,* D. (See page 83).—*Unguentum Hydrargyri,* D. E. *Unguentum Hydrargyri fortius,* L. ("Purified mercury; prepared lard, of each, equal parts; rub them together in a marble or iron mortar until the globules of mercury disappear," D.—"Mercury, ℔ij.; lard, ℥xxiij.; suet, ℥j.; triturate the mercury with the suet and a little of the lard till globules are no longer visible, then add the rest of the lard and mix the whole thoroughly," L. E.—"This ointment is not well prepared so long as metallic globules may be seen in it with a magnifier of four powers," E.).—*Unguentum Hydrargyri mitius,* D. L. E. ("Made with twice as much lard as the last," D.—"Mix ℔j. of the stronger ointment of mercury with ℔ij. of lard," L.—"The stronger ointment diluted with twice or thrice its weight of axunge," E.) Mercurial ointment is very frequently employed for introducing mercury into the system; and for this purpose, ℥ss. to ℥i. of the stronger ointment may be rubbed carefully into the inside of the thighs every morning. Should it be desirable to produce speedy salivation, it may be used as a dressing to blistered surfaces, and ℥j. or ℥ij. placed in each axilla. When employed to promote the dispersion of glandular enlargements, it should be rubbed over the seat of the disease. It is also smeared over the inflamed surface in phlegmonous erysipelas,—a practice often productive of very beneficial results. The milder ointment is generally used as a dressing to venereal sores.—*Ceratum Hydrargyri compositum,* L. (Stronger ointment of mercury; and soap cerate, of each, ℥iv.; camphor, ℥j.; rub together until they are incorporated). Employed to promote the dispersion of indolent tumours, and as an application to chronic enlargements of the joints.—*Linimentum Hydrargyri compositum,* L. (Stronger mercurial ointment; and lard, of each, ℥iv.; camphor, ℈i.; rectified spirit, f℥j.; solution of ammonia, f℈iv.; rub the camphor first with the spirit, then with the lard and ointment of mercury; lastly, the solution of ammonia being gradually poured in, mix them all). A stimulating liniment, applied to indolent tumours, &c., ℥j. contains nearly gr. x. of mercury. It produces salivation very speedily.—*Emplastrum Hydrargyri,* L. E. ("Mercury, ℥iij.; lead plaster, ℔j.; olive oil, f℥j.; sulphur, gr. viij.; add the sulphur gradually to the heated oil, stirring constantly with a spatula till they unite; afterwards rub the mercury with them until globules are no longer visible; then gradually add the plaster of lead melted with a slow fire, and mix them all," L.—"Mercury, ℥iij.; litharge plaster, ℈vj.; olive oil, f℥ix.; resin, ℥i.; melt the resin and oil, let them cool, add the mercury, triturate till the globules disappear, add the plaster previously melted, and mix the whole well," E.). Applied as a resolvent in glandular enlargements, and over the region of the liver in chronic induration of that organ.—*Emplastrum Ammoniaci cum Hydrargyro,* D. L. E. (Gum ammoniac, ℔j.; purified mercury, ℥iij.; common turpentine, ℥ij.; rub the mercury with the turpentine till the globules disappear, then add gradually the ammoniac melted. and with a medium heat rub together until they are incorporated," D.—"Ammoniac, ℔j.; mercury, ℥iij.;

olive oil, f℥i.; sulphur, gr. viij.; proceed as for *Emplastrum Hydrargyri*, L., substituting the ammoniac for the lead plaster," L. E.). Applied to indolent buboes, enlarged glands, especially when of a syphilitic origin, and to venereal nodes.—*Mercurial Soap*, HEBERT. (Take of mercury, and nitric acid, of each, ℥iv.; put these ingredients into a matrass capable of holding twice the above quantity, and stir the mixture from time to time until the solution shall have been effected at the ordinary temperature of the atmosphere. Introduce into a porcelain capsule, ℔i. ℥i. of calf's fat, melt this by the heat of a water bath, and then add the solution of mercury, stirring the ingredients together till they have acquired an adhesive consistence. To every ℥v. of the ointment thus formed add f℥ij. of caustic solution of soda, (Dens. 1·33), and rub them together on a porphyry slab until combination be effected). The soap thus formed is perfectly soluble in water. It is employed on the continent with much benefit in the treatment of those cutaneous affections, in which preparations of mercury usually prove useful; it is applied to the parts either alone or dissolved in water; care must be taken to suspend its use if it be found to produce irritation or inflammation.

### HYDRARGYRI ACETAS, D.—*Acetate of Mercury.*

PREPARATION.—*Dub.*—"Purified mercury, and acetate of potash, of each, 9 parts; dilute nitric acid, 11 parts; boiling distilled water, 100 parts; distilled vinegar, q. s.; add the nitric acid to the mercury, and the effervescence having ceased, digest the mixture until the metal is dissolved; dissolve the acetate of potash in the water and add distilled vinegar until the acid predominates; to this while boiling add the mercury dissolved in the acid, and filter quickly through doubled linen; let it cool that crystals may form; wash these with cold distilled water, and dry them on paper with a gentle heat. In the whole of this process, glass vessels must be used."

PHYSICAL PROPERTIES.—This salt occurs in the form of thin crystalline scales of a pearly lustre. It is inodorous, but has an acrid metallic taste.

CHEMICAL PROPERTIES.—It is composed of 1 eq. of suboxide of mercury, and 1 of acetic acid, ($Hg^2O+C^4H^3O^3$). Exposed to light it turns black, and is decomposed; heat expels its acetic acid, and if the temperature be increased, the mercury is volatilised. It requires for its solution 333 parts of cold water, but is much more soluble in boiling water, which, however, decomposes it into metallic mercury and acetate of the oxide of mercury. It is insoluble in cold alcohol.

THERAPEUTICAL EFFECTS.—This is a mild preparation of mercury but little employed at present; it has been therefore omitted from the London and Edinburgh Pharmacopœias. Externally dissolved in water it has been used as a lotion in chronic cutaneous diseases.

DOSE AND MODE OF ADMINISTRATION.—Gr. j. to gr. iij. twice a day, made into pill with conserve of roses or with manna. For a lotion, gr. j. may be dissolved in f℥i. of distilled water.—*Pills of Keyser*, (Acetate of mercury, gr. xij.; manna, ℥iij.; mix, and divide into 72 pills). This compound at one time bore a high character on the Conti-

nent as a remedy for secondary syphilitic eruptions. Each pill contains gr. 1-6th of the salt.

HYDRARGYRI BICHLORIDUM, L. HYDRARGYRI MURIAS CORROSIVUM, D. CORROSIVUS SUBLIMATUS, E. *Bichloride of Mercury; Corrosive Sublimate; Chloride of Mercury.*

PREPARATION.—*Dub.*—"Persulphate of mercury, 5 parts; dried muriate of soda, 2 parts; rub them well together in an earthen-ware mortar until a very fine powder is formed; then from a proper vessel sublime the corrosive muriate of mercury into a receiver."—*Lond.*—"Mercury, ℔ij.; sulphuric acid, ℔iij.; chloride of sodium, ℔iss.; boil the mercury with the sulphuric acid in a proper vessel till the bipersulphate of mercury remains dry; rub this when it is cold with the chloride of sodium in an earthen mortar, then sublime with a heat gradually raised."—*Edin.*—"Mercury, ℥iv.; sulphuric acid, f℥ij., f℥iij.; nitric acid, f℥ss.; muriate of soda, ℥iij.; mix the acids, dissolve the mercury in them with the aid of a moderate heat; raise the heat so as to obtain a dry salt; triturate this well with the muriate of soda, sublime in a proper apparatus."

PHYSICAL PROPERTIES.—Corrosive sublimate is met with in the form of a white, semitransparent, crystalline mass, or as a white powder; by careful sublimation it may be obtained in regular crystals, the primary form of which is the right rhombic prism. It is inodorous but has an intensely acrid and disagreeable taste. Its sp. gr. is 5·4 (Kane), 6·5 (Graham).

CHEMICAL PROPERTIES.—Although this salt is called a bichloride in the London Pharmacopœia, more recent chemical investigations have shown it to be a simple chloride, its composition being Hg. Cl. It is permanent in the air; it fuses at 509°, and boils at 563°; its vapour is colourless, but very acrid. It is soluble in 16 parts of cold and in 3 parts of boiling water, in $2\frac{1}{3}$ parts of alcohol and in 3 parts of ether. Its solubility is much increased by the addition of muriatic acid or of the alkaline muriates. A solution of corrosive sublimate gives a yellow precipitate with hydrates of potash, soda, or lime; a red precipitate with the alkaline mono-carbonates; a scarlet with iodide of potassium; and a black with sulphuretted hydrogen. Dropped on gold it does not tarnish it, but if the moistened surface be touched with a piece of iron or zinc, mercury is immediately precipitated, and leaves a white stain on the gold, which may be removed by heat. Corrosive sublimate may be removed from its solution in water, by agitation with ether.

*Adulterations.*—Corrosive sublimate seldom contains any impurity; its subliming without any residuum, and its complete and easy solubility in sulphuric ether, the tests given by the Edinburgh College, are sufficient to detect any adulteration.

THERAPEUTICAL EFFECTS.—Corrosive sublimate is a powerful irritant poison, a few grains producing death preceded by rapid and excessive inflammation of the digestive tube, with great derangement of the nervous system and coma. In small repeated doses, it possesses the usual action of a mercurial, but salivation is more slowly produced by it, and

its effects are more decidedly *alterative* than those of any other preparation of the metal. It is consequently much employed by those who believe that ptyalism is not essential to the curative effects of mercury, in the treatment of secondary syphilis. Corrosive sublimate is also employed with much benefit in chronic cutaneous diseases, in chronic rheumatism, in arthritis, periostitis, &c.; in which cases it is advantageously combined with a vegetable diaphoretic or tonic. Dissolved in water it forms a most useful lotion in psoriasis and lepra, and an excellent collyrium in the milder forms of ophthalmia.

Dose and Mode of Administration.—1-12th to 1-8th of a grain made into pill with crumb of bread, twice or three times daily.—*Pilulæ Corrosivi Sublimati*, Dzondi. (Corrosive sublimate, gr. xij.; dissolve in distilled water, q. s.; and add crumb of bread; and white sugar, of each, a sufficiency to make ccxl. pills). Each of these pills contains a 20th of a grain of sublimate; Dose, 4 daily. For a lotion or collyrium, gr. ss. to gr. j. may be dissolved in f℥j. of distilled water, or the following preparation may be employed.—*Liquor Hydrargyri Bichloridi*, L. (Bichloride of mercury, and hydrochlorate of ammonia, of each, gr. x.; distilled water, Oj.; dissolve together in the water). Dose, for internal use, f℥ss. to f℥ij.

Incompatibles.—The alkalies and their carbonates; lime, and its carbonate; tartar emetic; nitrate of silver; acetate of lead; iodide of potassium; albumen; soaps; almond mixture; decoction of bark, &c.

In cases of poisoning with corrosive sublimate, albumen, as white of egg, is the best antidote; it should not be given, however, in too great quantity as the compound formed is soluble in an excess of albumen; the yolk of egg has been recently proved to be an equally, if not more, efficacious antidote: in their absence, wheaten flour, milk, protochloride of tin, or iron filings may be used.

## Hydrargyri bicyanidum, L. Hydrargyri cyanuretum, D. *Bicyanide of Mercury; Cyanuret of Mercury; Cyanide of Mercury.*

Preparation.—*Dub.*—"Cyanuret of iron, 6 parts; nitric oxide of mercury, 5 parts; distilled water, 40 parts; mix the cyanuret of iron and oxide of mercury, and add the water, previously heated; boil for half an hour with constant agitation, and filter through paper; wash the residuum frequently with warm distilled water. Lastly, evaporate the filtered liquors and crystallize by cooling."—*Lond.*—"Percyanide of iron, ℥viij.; binoxide of mercury, ℥x.; distilled water, Oiv.; boil them together for half an hour and strain. Evaporate the liquor that crystals may be formed. Wash what remains frequently with boiling distilled water, and again evaporate the mixed liquors that crystals may be formed. Bicyanide of mercury may be otherwise prepared by adding as much binoxide of mercury as will accurately saturate it, to hydrocyanic acid distilled from ferrocyanide of potassium with diluted sulphuric acid."

Physical Properties.—This salt is met with crystallized in rectangular prisms; they are transparent or semi-opaque, colourless and inodorous, with a disagreeable metallic taste.

Chemical Properties.—This is a cyanide of mercury, its composition being Hg Cy. It is anhydrous; it is permanent in the air; exposed

to heat it is resolved into metallic mercury and cyanogen gas. It is soluble in 8 parts of water at 60°, and in much less boiling water, it is very sparingly soluble in alcohol.

Therapeutical Effects.—This salt resembles in its effects corrosive sublimate, to which it is preferred by many as being more soluble and not so easily decomposed. In this country, however, it is rarely used in medicine; and has been introduced into the Pharmacopœias merely as being employed in the preparation of hydrocyanic acid.

Dose and Mode of Administration.—Same as for corrosive sublimate.

Incompatibles.—Sulphuric and muriatic acids; sulphuretted hydrogen, and hydrosulphates.

Hydrargyri biniodidum, L. E.—*Biniodide of Mercury; Iodide of Mercury; Red iodide of Mercury.*

Preparation.—*Lond.*—"Mercury, ℥i.; iodine, ʒx.; alcohol, a sufficiency; rub the mercury and iodine together, adding the alcohol gradually until globules are no longer visible. Dry the powder with a gentle heat, and keep it in a well stopped vessel."—*Edin.*—"Mercury, ℥ij.; iodine, ℥iiss.; concentrated solution of muriate of soda, cong. j.; triturate the iodine and mercury together, adding occasionally a little rectified spirit till a uniform red powder be obtained. Reduce the product to fine powder, and dissolve it in the solution of muriate of soda with the aid of brisk ebullition. Filter if necessary, through calico, keeping the funnel hot; wash and dry the crystals which form on cooling."

Physical Properties.—It is a brilliant red powder, which may be obtained in rhomboidal crystals by sublimation. It is inodorous, but has a strong metallic taste. Its sp. gr. is 6·32.

Chemical Properties.—It is composed of 1 eq. of mercury, and 1 of iodine, Hg I. It is permanent in the air, heated moderately it becomes yellow, at a temperature of 400° it fuses, and at a higher temperature sublimes. Cooled rapidly it recovers its red colour, but when cooled slowly it remains yellow, in which state when rubbed, the red tint is immediately reproduced. It requires more than 6000 times its weight of water for solution; but it is much more soluble in alcohol and acids, particularly with the aid of heat. It is soluble in a boiling solution of common salt, but a mere trace only is retained as it cools. It is also soluble in a solution of iodide of potassium.

*Adulterations.*—Owing to faulty preparation, iodide of mercury is apt to contain some of the sesqui- or sub-iodide; it may also contain sulphuret of mercury, derived from impurity in the metallic mercury employed. These as well as any fixed impurity are guarded against by the tests of the *Edinburgh Pharmacopœia*. "Entirely vaporizable; soluble entirely in 40 parts of a concentrated solution of muriate of soda at 212°, and again deposited in fine red crystals on cooling."

Therapeutical Effects.—This is an exceedingly active preparation, producing violent inflammation when placed in contact with the skin. In its medicinal properties it appears to resemble much corrosive sublimate, and may be employed in the same cases. In doses of 1-12th

of a grain given twice daily, and continued for some time, I have found it an excellent tonic in scrofulous habits. I have also used it very extensively in the treatment of organic diseases of the heart, more especially in those valvular affections which permit regurgitation, with very beneficial effects. As a topical remedy, in the form of ointment, it is applied with benefit to chronic glandular enlargements. Its use, however, requires much caution, especially when applied to raw surfaces.

Dose and Mode of Administration.—Gr. 1-16th to gr. 1-8th made into pill with any of the tonic vegetable extracts.—*Unguentum Hydrargyri Biniodidi*, L. (Biniodide of mercury, ℥j.; white wax, ℥ij.; lard, ℥vj.; add the salt to the wax and the lard melted together and mix). This ointment is much too strong for ordinary use, and should be further diluted with 3 or 4 times its weight of lard.

Hydrargyri chloridum, L. Calomelas, D. E. *Calomel* (described in the division *Cathartics)*, is the most generally used, and one of the mildest preparations of mercury. It may be employed to produce the general effects of mercurials as before described; but it is almost exclusively administered in the treatment of inflammatory and febrile affections, in which it is usually given in combination with small doses of opium to prevent it from acting on the bowels. As a *sedative* in dysentery and in epidemic cholera, its use has been before alluded to (see page 338); in these diseases it is given in very large doses, (a scruple every hour or every second hour until two or three drachms are taken, or in single doses of ℥ss. to ℥ij.), with the very best effects. As an *alterative* it is very generally administered to children, who are not near so susceptible to the influence of calomel, or indeed of any other mercurial, as adults. To produce ptyalism, this is perhaps the most convenient of all the mercurial compounds, as salivation may be produced with it in a very short space of time, and with very little disturbance to the system generally. Its use as a cathartic has been before described (see page 70). Calomel is also added to other medicines to promote their peculiar effects; thus it is combined with digitalis or squill to produce *diuresis;* and with Dover's powder or antimonials to increase their *diaphoretic* properties.

Dose and Mode of Administration.—As an *antiphlogistic*, gr. iij. to gr. v. combined with one-fourth or one-half a grain of opium. As an *alterative*, gr. j. to gr. iij. twice a day. To produce *ptyalism*, gr. iij. to gr. v. are usually given night and morning; but by administering calomel in grain doses every hour, a sixth of a grain of opium being added to each dose should it affect the bowels, salivation may be produced in from 12 to 24 hours, provided proper preparatory treatment has been employed.—*Pilulæ Calomelanos compositæ.*, (see page 131); Dose as an alterative, gr. v. to gr. x.—*Pilulæ Calomelanos et Opii*, E. (Calomel 3 parts; opium, 1 part; conserve of red roses, q. s.; beat into a proper mass; to be divided into pills, each containing gr. ij. of calomel). Dose, one to two pills.—*Unguentum Calomelanos*, Pereira. (Calomel, ℥i.; lard, ℥j.). A most useful application in chronic diseases of the scalp, and in lepra and psoriasis.

HYDRARGYRI IODIDUM, L.—*Iodide of Mercury; Sub-iodide of Mercury.*

PREPARATION.—*Lond.*—"Mercury, ℥i.; iodine, ʒv.; alcohol, q. s.; rub the mercury and iodine together, adding the alcohol gradually, till globules are no longer visible. Dry the powder immediately with a gentle heat, without the access of light, and keep it in a well stopped vessel."

PROPERTIES.—This is a greenish-yellow powder, insoluble in both water and alcohol; its composition is $Hg^2$ I. Exposed to light, or by the application of heat, it is readily resolved into metallic mercury and the red iodide. It is insoluble in solution of chloride of sodium.

THERAPEUTICAL EFFECTS.—This is a much milder preparation than the red iodide of mercury, but in other respects its properties are nearly similar. It is peculiarly adapted as an alterative for the diseases of infancy and childhood, more particularly for the chronic cutaneous affections to which they are so liable.

DOSE AND MODE OF ADMINISTRATION.—Gr. j. to gr. iij. in pill; for children 1-6th of a grain to half a grain, combined with dried carbonate of soda and aromatic powder.—*Pilulæ Hydrargyri Iodidi*, L. (Iodide of mercury, ʒi.; confection of dog-rose, ʒiij.; ginger, powdered, ʒi.; beat together till they are incorporated). Gr. v. contain gr. j. of the iodide; Dose, gr. v. to gr. xv.—*Unguentum Hydrargyri Iodidi*, L. (Iodide of mercury, ℥j.; white wax, ℥ij.; lard, ʒvj.; add the iodide of mercury to the wax and lard melted together, and mix).

HYDRARGYRI NITRATIS UNGUENTUM, D. L. UNGUENTUM CITRINUM, D. E. *Ointment of the Nitrate of Mercury; Citrine Ointment.*

PREPARATION.—*Dub.*—"Purified mercury, *by weight* ℥j.; nitric acid, ʒxiss.; olive oil, *by measure* ℔j.; prepared lard, ℥iv.; dissolve the mercury in the acid, then mix in the oil and lard melted together, and make an ointment in the same manner as the nitric acid ointment."—*Lond.*—"Mercury, ℥i.; nitric acid, fʒxi.; lard, ʒvj.; olive oil, f℥iv., first dissolve the mercury in the acid; then mix the solution, while hot, with the lard and oil melted together."—*Edin.*—"Nitric acid (Dens. 1380 to 1390), f℥ixss.; mercury, ℥iv.; axunge, ʒxv.; olive oil, fʒxxxviiiss.; dissolve the mercury in the acid with the aid of a gentle heat. Melt the axunge in the oil with the aid of a moderate heat in a vessel capable of holding six times the quantity; and while the mixture is hot, add the solution of mercury also hot, and mix them thoroughly. If the mixture do not froth up, raise the heat a little till this take place. Keep the ointment in earthenware vessels, or in glass vessels secluded from the light."

PROPERTIES.—When recently prepared, this ointment is of a golden-yellow colour, and has an odour of nitrous acid. But it does not keep well, as no matter how carefully prepared, after some time it acquires a grayish colour and becomes hard, when it is no loger fit for use. It has been stated, however, that if neat's foot oil be used in the preparation of citrine ointment instead of olive oil, it is not changed by keeping.

THERAPEUTICAL EFFECTS.—Citrine ointment is an excellent application

in many forms of chronic ophthalmia, being especially useful when the eyelids are the seat of the disease; for this purpose it is generally diluted with an equal weight of lard. It is also an excellent application to herpetic eruptions, and to chronic eczema, impetigo or porrigo of the scalp, provided no inflammatory symptoms be present.

HYDRARGYRI OXYDUM, L. HYDRARGYRI OXYDUM NIGRUM, D.—*Oxide of Mercury. Sub-oxide of Mercury. Black Oxide of Mercury.*

PREPARATION—*Dub.*—"Sublimed calomel, 1 part; water of caustic potash, heated, 4 parts; triturate together until the oxide acquires a black colour, and wash frequently with water; then with a medium heat, dry the oxide on bibulous paper."—*Lond.*—"Chloride of mercury, ℥i.; lime water, cong. j.; mix, and frequently shake them. Set by, and when the oxide has subsided, pour off the liquor; lastly wash it in distilled water until nothing alkaline can be perceived, and dry it in the air wrapped in bibulous paper."

PROPERTIES.—This is a black or grayish-black, heavy powder, tasteless and odourless. Its density is 10·69; its composition, $Hg^2$ O. Exposed to heat it is resolved into metallic mercury and the oxide, and this change takes place slowly at ordinary temperatures, under the action of strong light; it then acquires a yellowish tinge. It is insoluble in water, and in the solutions of the alkalies, but it dissolves in nitric and acetic acids, combining with them to form salts.

*Adulterations.*—This preparation frequently contains the higher oxide, which may be detected by digesting for a short time with dilute muriatic acid, and straining; the acid dissolves out the higher oxide only, which is thrown down in the form of a yellow precipitate on the addition of solution of potash. If it contain any fixed impurity, it will not be entirely dissipated by heat. Metallic mercury may be detected by the black oxide not being completely soluble in acetic acid.

THERAPEUTICAL EFFECTS.—Black oxide of mercury produces the usual effects of the mercurial preparations, but owing to its varying composition, and the difficulty of preserving it unchanged, it is not employed internally. It is applied externally in the form of ointment (consisting of 1 part of oxide to 5 of lard), and it forms the active part of *black wash*, a most excellent application to chancres and other venereal sores, and which is in very general use.—*Lotio nigra, Black wash*, (Calomel, ʒi.; lime water, f℥xij.; mix). This wash must be well shaken, so as to suspend the black oxide every time it is used. It is employed with benefit in most foul and indolent sores, although not of a venereal origin. Black oxide of mercury is also employed for mercurial fumigations, (see *Hydrargyri sulphuretum rubrum*).

HYDRARGYRI OXYDUM RUBRUM, D. HYDRARGYRI BINOXYDUM, L.—*Red oxide of Mercury. Binoxide of Mercury. Oxide of Mercury.*

PREPARATION.—*Dub.*—"Purified mercury, any quantity, put it into a glass matrass with a long narrow neck, and expose it to a heat of about 600°, until it

is converted into red scales." *Lond.*—"Bichloride of mercury, ℥iv.; solution of potash, f℥xxviij; distilled water, Ovj.; dissolve the bichloride in the water; strain and add the solution of potash. The liquor being poured off, wash in distilled water the powder thrown down, until nothing alkaline can be perceived, and dry it with a gentle heat."

Physical Properties.—This oxide is met with in the form of small brilliant red scales, when prepared according to the formula of the Dublin Pharmacopœia; but when obtained by the process of the London College, it is an orange-red powder, odourless, with a disagreeable metallic taste. Sp. gr. 11·074.

Chemical Properties.—Its composition is Hg O, being a protoxide. At a heat below redness it is entirely resolved into metallic mercury and oxygen, and is therefore frequently employed in chemistry for procuring that gas. It is very slightly soluble in water, the solution acting feebly alkaline on vegetable colours.

*Adulterations.*—This preparation seldom contains any impurity. The best test of its freedom from adulteration is its complete solubility in muriatic acid.

Therapeutical Effects.—Red oxide of mercury is not employed internally in medicine, in the present day. It was formerly used to produce salivation. The dose is from gr. ¼ to gr. iss. in pill. It may be used externally for the same purposes as the nitric oxide (see page 122), but is less caustic. It forms the active part of *yellow wash*, which is preferred by some to *black wash*, as an application to venereal sores.—*Lotio flava, Yellow wash*, (Corrosive sublimate, ℈j.; lime water, f℥xij.; mix).

Hydrargyri persulphas, D.—*Persulphate of Mercury. Sulphate of Mercury.*

Preparation.—"Purified mercury; and sulphuric acid, of each, 6 parts; nitric acid, 1 part; expose them to heat in a glass vessel, and increase the heat until a perfectly dry, white mass be obtained."

This preparation, the composition of which is Hg O, $SO^3$, has not been used in medicine. It is introduced into the pharmacopœias, as being employed in the preparation of *sulphuric oxide of mercury*, (see page 202), of *sublimed calomel*, and of *corrosive sublimate*.

Hydrargyri submurias ammoniatum, D. Hydrargyri ammonio-chloridum, L. Hydrargyri precipitatum album, E. *White precipitate. Ammoniated submuriate of Mercury. Ammonio-chloride of Mercury. White precipitate of Mercury.*

Preparation.—*Dub.*—"Add to the liquor which is poured off from precipitated calomel sufficient water of caustic ammonia, to throw down the metallic salt; which is to be washed with cold water, and dried on bibulous paper."—*Lond.—Edin.*—"Bichloride of mercury (corrosive sublimate, E.), ℥vj.; distilled water, Ovj.; solution of ammonia, f℥viij.; dissolve the corrosive subli-

mate in the water with the aid of heat; to this when cold, add the ammonia, stirring frequently; collect the powder thrown down (on a calico filter, E.), and wash it thoroughly (with cold water, E.), (until it is free from taste, then dry it, L.)."

Physical Properties.—This preparation is in the form of a bulky milk-white powder, odourless but having a styptic metallic taste.

Chemical Properties.—It is a true chloro-amidide of mercury, its formula being Hg Cl + Hg Ad (Kane). It is insoluble in cold water; by boiling water it is decomposed into sal-ammoniac which is dissolved, and into a heavy yellow powder *(chloro-amidide and binoxide of mercury,* Kane) which is insoluble in water. White precipitate may be distinguished from calomel by solution of ammonia, which does not alter the former, but blackens the latter. When heated suddenly, it is completely dissipated.

*Adulterations.*—I have never met with any impurity in this preparation. The London College has given the following tests for its purity, which have reference to its adulterations with starch, with white lead, with sulphate or carbonate of lime, or with black oxide of mercury:—Totally evaporated by heat. When digested with acetic acid, iodide of potassium throws down nothing either yellow or blue. The powder rubbed with lime water does not become black. It is totally dissolved by hydrochloric acid without effervescence. When heated with solution of potash it becomes yellow, and emits ammonia."

Therapeutical Effects.—White precipitate is not used as an internal remedy. Externally in the form of ointment, it is an excellent application in many forms of chronic cutaneous diseases, as herpetic eruptions, sycosis mentis, impetigo, &c.—*Unguentum Hydrargyri submuriatis ammoniati,* D.—*Hydrargyri ammonio-chloridi,* L.—*precipitati albi,* E. (White precipitate, 3i.; prepared lard, ℥iss.; add the white precipitate to the lard melted over a slow fire, and mix).

Hydrargyri sulphuretum nigrum, D. Hydrargyri sulphuretum cum sulphure, L.—*Black Sulphuret of Mercury. Æthiops Mineral.*

Preparation.—*Dub.—Lond.*—"Mercury (purified, D.); and sulphur, (sublimed, D.), of each, 1 part (℔j., L.); rub them together (in a stone-ware mortar, D.) until globules are no longer visible."

Properties.—This is a heavy, black, insipid, and inodorous powder, the composition of which is not well known. It is insoluble in water. By heat it is fused, and completely dissipated.

*Adulterations.*—The complete dissipation by heat will show the absence of any fixed impurity, such as charcoal, or ivory black.

Therapeutical Effects.—This preparation was at one time employed as an alterative in glandular and cutaneous diseases, but in the present day it is rarely used. The dose of it is from gr. v. to 3ss.

HYDRARGYRI SULPHURETUM RUBRUM, D. HYDRARGYRI BISULPHURETUM, L. CINNABARIS, E.—*Red Sulphuret of Mercury. Cinnabar.*

PREPARATION.—*Dub.—Lond.—Edin.*—"Mercury, (purified, D.), 21 parts (℔ij., L. E.); sulphur (sublimed, D.), 3 parts (℥v. L. E.); mix the mercury with the sulphur melted, (and as soon as the mass swells up, remove the vessel from the fire, L. E.); and cover the vessel closely to prevent the mass from taking fire. Then reduce the material to powder (as soon as it is cold, E.), and sublime it."

PHYSICAL PROPERTIES.—This is the most common ore of mercury. When prepared for medical use, it occurs in the form of dark red crystalline masses, which when reduced to fine powder are of a brilliant rich-red colour, and then constitute the pigment *vermillion*. It is without odour or taste, and is insoluble in water, alcohol, or ether. Its sp. gr. is 8.1.

CHEMICAL PROPERTIES.—Cinnabar is composed of one eq. of mercury and one of sulphur, its formula being Hg, S. It is permanent in the air; by exposure to heat it is first blackened, and then totally dissipated. It is inflammable, burning with a blue flame, and a sulphurous-acid odour.

*Adulterations.*—Cinnabar is very liable to be adulterated with red-lead, with realgar *(sulphuret of arsenicum)*, with red oxide of iron, and with earthy impurities. When heat is applied, oxide of iron or any earthy matter will be left; if the impurity be red-lead, metallic globules of lead will remain. Sulphuret of arsenicum may be detected by the usual tests for the preparations of that metal (see page 120).

THERAPEUTICAL EFFECTS.—Cinnabar is not used as an internal remedy. It is the preparation of the metal most generally employed for mercurial fumigations; for which purpose it is thrown on a plate of heated iron, and the fumes thus evolved, either inhaled to produce salivation, or directed on ulcerated parts. Mercurial fumigations, however, may be conducted in a much more easy manner, as proposed by the late Mr. Colles, "by directing the intended dose of cinnabar or grey oxide of mercury to be mixed with melted wax, and with a cotton wick be moulded into a small candle; this may be stuck on a common plate, and then burned under a curved glass funnel, which is to be raised about an inch from the plate." Fumigations with the *mercurial candle* may be conveniently directed on any part of the body. They were highly recommended by Mr. Colles, for those obstinate ulcerations which occur about the roots of the nails.

INDIGO.—*Indigo.* A peculiar colouring matter obtained from the leaves of several species of the genus *Indigofera*, especially *tinctoria* and *cerulæa;* which are natives of India, and belong to the Natural family *Leguminosæ (Fabaceæ*, Lindley), and to the Linnæan class and order *Diadelphia Decandria.*

PREPARATION.—The plants are cut down just before the flowers appear,

placed in large vats and covered with water; in which they are left for about 12 hours, until fermentation takes place, which process is sometimes promoted by using lime water. The liquor, which has acquired a yellow colour, is drawn off, into another vat, beaten with rods, and constantly agitated until it becomes blue, and the indigo precipitates. It is then drained on calico, pressed and dried.

Physical Properties.—Indigo as met with in commerce is of a deep blue colour shaded with violet, smooth and hard; when rubbed it acquires a metallic appearance. It is inodorous, but has a somewhat metallic taste.

Chemical Properties.—Indigo is a compound substance consisting of *a glutinous matter, indigo blue* (indigotin), *indigo brown,* and *indigo red.* The formula of indigo blue is $C^{16}$ $H^5$ N $O^2$. It is insoluble in water, in cold alcohol and in ether; it is partially soluble in boiling alcohol.

Therapeutical Effects.—Indigo has been recently employed on the Continent in the treatment of nervous and spasmodic diseases, and it is said with great success. The diseases in which it has been found to be peculiarly beneficial are idiopathic epilepsy, chorea, hysteria, and convulsions.

Dose and Mode of Administration.—It should be given in as large doses as the stomach will bear, but as it acts with much difference on different individuals, the dose should not at first exceed five grains three times a day, but it should be rapidly increased until ʒj. or even more is taken daily. It is best administered in the form of electuary, made with one part of indigo and two of syrup or honey; with which, aromatics are in general combined.—*Compound Pills of Indigo,* (Indigo, gr. xv.; Opium, powdered, gr. ij.; extract of valerian; and extract of cinchona, of each, gr. xxij.; mix and divide into 24 pills). Dose, 4 daily. This combination has been highly praised by M. Michel, in idiopathic epilepsy; he directs for the patient at the same time a wine-glassful of infusion of arnica morning and evening.

## Iodinium, D. L. Iodineum, E.—*Iodine.*

Preparation.—Iodine is an article of the Materia Medica in the three British Pharmacopœias. It is procured by the manufacturers on the large scale from the ashes obtained by burning various species of sea weed. These ashes, technically called *kelp,* are lixiviated with water to which they yield about half their weight of salts. The mother liquor is poured off from these salts which are deposited by evaporation and crystallization; it is then treated with sulphuric acid, and as soon as all effervescence has ceased in about a day or two, it is put into leaden retorts with black oxide of manganese, and heated to 140° F., when the iodine passes over in the state of vapour and is condensed in proper receivers.—"As met with in commerce, iodine is generally adulterated with variable proportions of water, and being consequently unfit for making pharmaceutic preparations of fixed and uniform strength, it must be dried by being placed in a shallow basin of earthen-ware in a small confined space of air with ten or twelve times its weight of fresh burnt lime, till it scarcely adheres to the inside of a dry bottle," *Edin.*

Physical Properties.—Iodine is generally met with in the form of

small crystalline scales, often accreted into masses of a bluish-black colour, with a metallic lustre. It has a strong disagreeable odour resembling that of chlorine, and a very acrid taste. From a solution in liquid hydriodic acid, it may be obtained in tolerably large crystals, which are oblique octohedrons with a rhombic base. Its density is 4·947.

Chemical Properties.—Iodine is an elementary body existing in combination in both kingdoms of nature. It evaporates slowly at the usual temperature if exposed to the air, and more rapidly if moistened. It fuses at 225°, and boils at 347°. Exposed to an increased temperature it is volatilized in the form of a beautiful violet-coloured vapour from whence it has derived its name, (Ἰώδης, violet). It requires 7000 parts of pure water for its solution, to which it imparts a brownish colour; it is much more soluble in alcohol, and very soluble in ether. Solutions of the iodides in water dissolve much iodine; the best characteristic of iodine is its action on starch, (see page 172).

*Adulterations.*—Iodine is frequently adulterated with fixed substances, such as charcoal, plumbago, black oxide of manganese, &c., all of which may be readily detected by their not being sublimed on the application of heat, or by their being left as an insoluble residue when iodine is treated with alcohol. Attention has been also directed by Professor Christison to an adulteration of much consequence, that with water, of which it frequently contains from 15 to 20 per cent: that is to say, ʒj. of iodine may contain ʒiss. or even more of water. It may be readily detected by pressing a specimen between folds of filtering paper, or by shaking it in a very dry bottle. If greater accuracy be required, the test of the *Edinburgh Pharmacopœia* may be applied—"Gr. xxxix. with gr. ix. of quick lime, and fʒiij. of water when heated short of ebullition, slowly form a perfect solution, which is yellowish or brownish, if the iodine be pure, but colourless if there be above two per cent of water or other impurity."

Therapeutical Effects.—Introduced into the stomach, iodine exerts a local irritant action on that viscus, causing nausea and vomiting; in large doses, it produces the effects of an irritant poison, but in many instances even when taken in enormous quantities, it has produced scarcely any effect. In slight or medicinal doses, iodine acts as a special stimulant to the glandular system, generally at the same time affecting the organs of secretion, increasing the quantity of fluid secreted. Under the continued use of small doses of this substance, the removal or palliation of disease will sometimes take place without any perceptible action on the system generally; in other instances, much emaciation and derangement of the digestive functions will be produced; while the very reverse effect, namely, deposition of fat and increased appetite, has been noticed by many as the consequence of a lengthened administration of iodine. A curious fact, but which has been rarely if at all witnessed in this country, is, that absorption of the mammæ in females, and wasting of the testicles in males have been produced by the continued administration of iodine.

A remarkable train of symptoms, characterising a peculiar disordered state of the system which has been named *iodism*, frequently arises when the use of this substance in frequent small doses has been persisted in for a long time. These symptoms are nausea, head-ache, general languor

and loss of appetite, followed by vomiting and purging, extreme depression, frequent small pulse, great weakness, fainting, dry cough, occasionally attended by inflammation of the mucous membrane lining the air passages, and terminating in death, if the iodine be not abandoned in time. Iodism is, however, in the present day, rarely witnessed, and when it does occur, it is easily checked by suspending the use of the medicine.

Iodine is a most valuable remedial agent in the treatment of glandular enlargements, and in scrofulous affections; but its employment is contra-indicated when acute inflammation is present. In *bronchocele*, it has proved more successful than any other remedy which has been ever used; indeed there are few cases, unless where the thyroid gland has become completely indurated, which will withstand the use of iodine when continued steadily for six weeks or two months; and even cases where the gland is much indurated, are often remarkably relieved. In the innumerable varieties of scrofulous affections, this remedy is most extensively used and with decided advantage. It is found particularly beneficial in glandular swellings, tumors, abscesses, ulcers, ophthalmia, and diseases of the bones occurring in scrofulous constitutions. Iodine has also proved eminently successful in chronic enlargements of the abdominal viscera, particularly the liver, spleen, and ovaries. In fine, it has been proposed as a remedy in phthisis, in amenorrhœa, in leucorrhœa, in gout, in palsy, in chorea, in ascites, in chronic cutaneous diseases, &c.; but in all these cases, its success is very equivocal. The inhalation of the vapour of iodine was at one time very much used in the treatment of phthisis and of chronic bronchitis, but general experience has proved its inutility. An injection composed of one part of tincture of iodine and three parts of water, is used after tapping, for the radical cure of hydrocele. Topically, iodine is employed in the form of tincture or of ointment as a local stimulant in many forms of chronic cutaneous diseases, to enlarged glands, in chronic swellings of the joints, to inflamed bursæ, to buboes, over large chronic abscesses, &c.

Dose and Mode of Administration.—Iodine is not administered in substance. The following are the simple preparations which are generally employed, but it is usually given in combination with iodide of potassium, (see page 362).—*Tinctura Iodinii*, D. E. (Iodine, ℈ij. (℥iiss., E.); rectified spirit, ℥j. (Oij., E.); dissolve the iodine in the spirit with the aid of a gentle heat and agitation; keep the tincture in well closed bottles). One fluid-drachm *(Dub.)* contains gr. v. of iodine; Dose, min. v. to min. xx. two or three times a day; it may be given in f℥ss. of water and sweetened with simple syrup.—*Unguentum Iodinii*, D. (Iodine, ℈j.; prepared lard, ℥j.; triturate together so as to make an ointment). The simple iodine ointment is seldom used in the present day.

In poisoning with iodine, emetics should be administered and their operation aided by the use of demulcent and amylaceous drinks, as starch, flour, &c., diffused through tepid water or milk.

## Morrhuæ oleum. Oleum jecoris aselli. *Cod-liver Oil.*

Preparation.—This oil is obtained from the liver of the Common Cod, *Morrhua Vulgaris*, and of other allied species, as the Ling—*Gadus Lota*, the Dorse—*Gadus Callarias*, the Torsk—*Gadus Brosma*, &c. Much of what is met with is imported from Newfoundland, where it is prepared by exposing the livers to the sun to putrefy, when the oil runs from them and is received in vessels placed underneath. What is drawn in this country, is procured by simply boiling the fresh livers (exposing them to a temperature not higher than 192° F., Donovan), expressing and filtering.

Physical Properties.—As generally met with, cod-liver oil is transparent, of a golden-brown colour, with the odour of fresh boiled cod, and a greasy, bland taste, leaving a disagreeable impression on the palate. Some specimens have a very rancid odour, and an exceedingly nauseous taste. On the Continent four varieties of different colours are usually met with, but in this country, we are only acquainted with that above described.

Chemical Properties.—According to the analysis of M. Jongh, it contains three peculiar principles, one of which has been named *gadeïne*, oleic and margaric acids, glycerine, traces of butyric, acetic, fellinic, and cholinic acids, salts of soda, lime, and magnesia, some other unimportant substances, phosphoric acid, iodine, and chlorine, with a trace of bromine. It is to the presence of the iodine, the chlorine, and bromine, but more especially the phosphates, that its peculiar medicinal properties are due.

Therapeutical Effects.—Cod-liver oil, although at one time much employed in England, had completely fallen into disuse, until within the last few years; when some extensive trials with it as a remedy in Germany, again directed attention to its value as a therapeutic agent. It has been employed in a great number of diseases, but it appears to be particularly useful in chronic rheumatism, in scrofulous abscesses and caries of the bones, in phthisis, in arthritis, in rickets, in strumous ophthalmia, and in obstinate cutaneous affections. It is productive of very great benefit in the treatment of many forms of neuralgia; and it is unquestionably a most useful remedy in many cases of phthisis, indeed it is stated by some practitioners to hold out the only hope of cure in this malady. I have employed cod-liver oil in the treatment of some cases of diabetes, in all with much benefit, and in one with complete success. In most of these diseases, its external application is beneficially combined with its internal use; and to prove successful, its administration must be persevered in for a very long period, in some instances even for years; and as large a quantity taken as the stomach will tolerate.

Dose and Mode of Administration.—The dose of this oil is from f℥ss. to f℥i. two or three times a day, and gradually increased to f℥iii. or f℥iv. It may be given made into an emulsion with a solution of potash and some aromatic water. But no matter how it is attempted to be disguised, it leaves a most disagreeable and permanent impression on the mouth and fauces, which together with the length of time its administration must be persisted in, has prevented it from coming into general use. Dr. Ure has recently suggested the adoption of cod livers as a diet for patients who are recommended to take the oil; and in order to prevent

the dissipation of the oil during the cooking, the livers should be suddenly immersed in boiling water, to which sufficient salt has been added to raise the boiling point to 220° F. He states that he has used this diet himself without inconvenience, employing mashed potato as a vehicle for the oil which exudes on cutting the liver. Copeland recommends the liver to be used as an article of diet, prepared in the following way :— The stomach of the fish is well washed, two parts filled with the fresh liver, and firmly tied at each end so as not to allow any of the oil to escape whilst being boiled. This is eaten *quite warm*, with a little salt and spice, in which state he says that it is very palatable.

The oil obtained from the liver of the Skate, *Raia Clavata*, has been proposed as a substitute for cod-liver oil; it is stated to be less disagreeable to the taste, and also fully more efficacious in its therapeutic effects.

Nux-vomica, D. L. E. *Seeds of Strychnos nux-vomica.* A native of the Indian Continent, of the Coasts of Coromandel, and of the Island of Ceylon; belonging to the Natural family *Apocynaceæ (Loginaceæ*, Lindley), and to the Linnæan class and order *Pentandria Monogynia.*

Botanical Characters.—A moderate sized tree ; Trunk thick, with a greyish mottled bark covered in parts with a reddish-brown efflorescence ; Branches, opposite, long ; Leaves, oval, shining, leathery, 5-nerved ; Flowers in small terminal corymbs greenish-white ; Fruit, ovoid, orange-coloured, one-celled, pulpy, about the size of a small apple, containing many seeds.

Physical Properties.—Strychnos seeds, *nux-vomica*, are about an inch in diameter and two lines thick, round, nearly flat, umbilicated and slightly convex on one side, concave on the other. Externally they are of an ash-grey colour, satiny, covered with short yellowish hairs ; internally they consist of a horny, whitish or yellowish *albumen*, which separates into two parts, and contains, in a small cavity in the circumference, the *embryo* with its two acuminate cotyledons. Nux-vomica seeds are with difficulty reduced to powder ; they are inodorous, but have an acrid, intensely bitter taste. The bark has been occasionally met with in British commerce under the name of False-angustura bark (see Cusparia).

Chemical Properties.—Nux-vomica consists of two peculiar alkaloids, *strychnia* and *brucia*, in combination with a peculiar acid, *igasuric* or *strychnic acid*, with other unimportant matters. Its medicinal properties depend on the alkaloids, the former of which is the more active, and is officinal in the London and Edinburgh Pharmacopœias. It is prepared as follows :—

*Lond.*—" Nux-vomica, bruised, ℔ij. ; rectified spirit, cong. iij. ; diluted sulphuric acid ; magnesia ; and solution of ammonia, of each, q. s. ; boil the bruised nux-vomica with a gallon of the spirit for an hour in a retort, to which a receiver is fitted, pour off the liquor, and again, and a third time boil what remains with another gallon of spirit, and the spirit recently distilled, and pour off the liquor. Press the nux-vomica, and let the spirit distil from the mixed and strained liquors. Evaporate what remains to the proper consistence of an

extract. Dissolve this in cold water and strain. Evaporate the liquor with a gentle heat until it has the consistence of a syrup. To this, while yet warm gradually add the magnesia to saturation, shaking them together. Set it aside for two days, then pour off the supernatant liquor. Press what remains wrapped in cloth. Boil it in the spirit, then strain, and let the spirit distil. Add to the residue a very little diluted sulphuric acid mixed with water, and macerate with a gentle heat. Set it aside for 24 hours that crystals may form. Press and dissolve them. Afterwards to these dissolved in water add ammonia, frequently shaking them, that the strychnia may be thrown down. Lastly, dissolve this in boiling spirit, and set it aside that crystals may be produced." *Edin.*—" Nux-vomica, ℔j. ; quicklime, ℥iss. ; rectified spirit, q. s. ; subject the nux-vomica for 2 hours to the vapour of steam, chop or slice it, dry it thoroughly in the vapour-bath or hot-air press, and immediately grind it in a coffee-mill. Macerate it for 12 hours in Oij. of water and boil it ; strain through linen or calico, and squeeze the residuum ; repeat the maceration and decoction twice with Oiss. of water. Concentrate the decoctions to the consistence of thin syrup ; add the lime in the form of milk of lime ; dry the precipitate in the vapour-bath, pulverize it, and boil it with successive portions of rectified spirit, till the spirit ceases to acquire a bitter taste. Distil off the spirit till the residuum be sufficiently concentrated to crystallize on cooling. Purify the crystals by repeated crystallizations."

*Strychnia* crystallizes in colourless minute octohedrons, but as met with in commerce it is usually in the form of a greyish-white granular powder ; it is odourless, but has an intensely bitter taste. It is soluble in 2500 parts of boiling, and in 6667 parts of cold water ; but this last solution, if still further diluted with 100 times its weight more of water tastes strongly bitter. It dissolves in diluted alcohol, but is insoluble in absolute alcohol and in ether. It is permanent in the air ; it acts as an alkali on vegetable colours, and combines with acids to form salts. The composition of strychnia is $C^{44}H^{23}N^{2}O^{4}$, (Regnault).

*Brucia* is not employed in medicine, and therefore need not be particularly described here. In most of its properties it resembles strychnia, but it is more soluble in water, and produces a rich red colour with nitric acid, which change does not occur with perfectly pure strychnia. Powdered nux-vomica is of a grayish-yellow colour ; it yields its active principles to water and diluted alcohol, but not to ether.

*Adulterations.*—According to Christison, powdered nux-vomica is frequently adulterated with common salt, but I have never met with this impurity ; it may be readily discovered, by treating the powder with cold water, filtering, evaporating and crystallizing. Strychnia is very liable to adulteration, and as met with in commerce is never free from brucia and colouring matter, and consequently among the characteristics of the alkaloid, the Edinburgh College has stated, that it is strongly reddened by nitric acid, which as above remarked does not occur unless brucia be present : that it is sufficiently pure for medical purposes, may be known by the following test :—" A solution of gr. x. in f℥iv. of water by means of f℥i. of pyroligneous acid, when decomposed by f℥i. of concentrated solution of carbonate of soda, yields on brisk agitation an adhesive mass, weighing when dry gr. x. and entirely soluble in solution of oxalic acid," *Edinburgh Pharmacopœia.*

Therapeutical Effects.—In very small doses, nux-vomica appears to act as a tonic ; but in somewhat larger doses it operates as a special stimulant to the medulla oblongata and spinal marrow, without affecting

the sensorium. Its effects are principally exerted on the nerves of motion, as indicated by the spasmodic twitchings of the voluntary muscles, which, when the dose is large or the use of small doses has been continued for some time, amount to violent tetanic spasms. It is a very active poison, so small a dose as ʒss. of the powder, or gr. j. of pure strychnia having proved fatal; the symptoms which precede death are simply those of tetanus and asphyxia. As a medicinal agent, the principal use of nux-vomica has been in the treatment of chronic paralytic affections; but as it does not prove equally serviceable in all forms of paralysis, and in some proves absolutely injurious, it will be necessary to state the circumstances which demand or contra-indicate its use.

When paralysis is the consequence of inflammatory action in the brain or spinal marrow, or is produced, by what is indeed the most common cause, the pressure of effused blood on the nervous centres, nux-vomica always proves injurious, unless the inflammatory action has been previously subdued, or a length of time has elapsed since the effusion had taken place. It more frequently proves beneficial in general than in partial paralysis, and in paraplegia than in hemiplegia. It is, however, often of service in palsy of certain organs, as in incontinence of urine depending on paralysis of the muscles of the bladder, and in some forms of amaurosis when applied by the endermic method. Nux-vomica and its alkaloid have been also employed in the treatment of other affections of the nervous system, as in chorea, epilepsy, and nervous tremors; in the latter of which it appears to have proved of most service. I have used extract of nux-vomica with much advantage as an addition to purgatives in constipation depending on want of tone in the muscular coat of the large intestines, one of the most frequent causes of this state in females, and one which is distinctly characterized by the great secretion of flatus, and colicky pains which accompany it; for a nearly similar reason it is a most useful remedy in the constipation of painter's colic. In epidemic dysentery, its beneficial effects have been highly spoken of in Germany and in Sweden; and by various practitioners it has been found successful occasionally, in the treatment of amenorrhœa, of hypochondriasis, of dyspepsia, of gastrodynia, of prolapsus ani, of impotence, &c. It is remarkable that when administered in paralysis, the effects of nux-vomica on the muscular system are principally, though not, as was one time imagined—entirely confined to the paralysed parts.

Dose and Mode of Administration.—Nux-vomica may be administered in powder in doses of gr. v. gradually increased to gr. xx.; but in the present day, it is almost entirely displaced by strychnia.—*Extractum Nucis Vomicæ*, D. E. ("Nux-vomica, rasped, ʒviij.; proof spirit, *by measure* ℔ij.; digest in a closed vessel for 3 days, filter the liquor, and express what remains by a press; to this add ℔iss. of proof spirit, digest the mixture for 3 days, and express the residuum. Distil the mixed liquors to a fourth part, and reduce to a proper consistence," D.—"Take of nux-vomica, any convenient quantity; expose it in a proper vessel to steam until it is completely softened; slice it, dry it thoroughly, and grind it in a coffee-mill; exhaust the powder either by percolating it with rectified spirit, or by boiling it with repeated portions of rectified spirit, till the spirit comes off free of bitterness. Distil

off the greater part of the spirit; and evaporate what remains to a proper consistence in the vapour-bath," E.) ; Dose gr. ss. gradually increased to gr. iij. in the form of pill. When carefully prepared, this extract is an excellent preparation, and might be used instead of strychnia, which is very difficult to prepare, and in general is so much adulterated.—*Tinctura Nucis Vomicæ,* D. (Nux-vomica, rasped, ℥ii.; rectified spirit, ℥viij.; macerate for 7 days and filter). In consequence of its intense bitterness, the tincture is not much used internally, it is, however, a most excellent remedy in the treatment of nervous tremors and of other nervous symptoms which are so often dependent on dyspepsia and hypochondriasis. Externally it is sometimes employed in the form of embrocation to paralysed parts. Dose, min. x. to min. xxx.—*Strychnia,* L. E. Dose, 1-12th of a grain gradually and slowly increased until its effects are produced; always diminishing the dose at first, when a different sample of the drug is employed. It is usually given made into pill with crumb of bread, or with conserve of roses: but as it is difficult to divide it with sufficient accuracy into pills; a preferable method is to dissolve a grain in f℥ij. of rectified spirit, with the aid of min. ij. of sulphuric or acetic acid; so that every min. x. of this solution will contain 1-12th of a grain of the salt of strychnia. When applied by the *endermic* method, gr. ss. of the alkaloid may be sprinkled over the surface previously denuded of its cuticle, or the above solution may be used. No matter how administered, great attention is requisite during the use of nux-vomica or its alkaloid, in consequence of their great activity as poisons, our ignorance of any chemical antidote, and from the fact of some individuals being much more susceptible of their effects than others.

### Plumbi Iodidum, L. E.—*Iodide of Lead.*

Preparation.—*Lond.*—"Acetate of lead, ℥ix.; iodide of potassium, ℥vij.; distilled water, cong. j.; dissolve the acetate of lead in Ovj. of the water and strain; add to these the iodide of potassium first dissolved in Oij. of the water, wash what is precipitated and dry it."—*Edin.*—"Iodide of potassium, and nitrate of lead, of each, ℥ss.; water, Oiss.; dissolve the salts separately, each in one-half of the water, add the solutions, collect the precipitate on a filter of linen or calico, and wash it with water; boil the powder in cong. iij. of water acidulated with f℥iij. of pyroligneous acid. Let any undissolved matter subside, maintaining the temperature near the boiling point, and pour off the clear liquor, from which the iodide of lead will crystallize on cooling."

Properties.—Iodide of lead occurs in the form of a fine golden-yellow powder, or in brilliant crystalline scales of the same colour. It is odourless and tasteless; it is permanent in the air, but by exposure to light, loses its brilliancy; by heat it is fused. It is soluble in 1235 parts of cold, and 194 parts of boiling water; it is also soluble in solution of potash. The composition of iodide of lead is Pb I.

*Adulterations.*—I have not met with any adulteration in iodide of lead. The following tests for its purity are given in the Edinburgh Pharma-

copœia.—"Bright yellow; gr. v. are entirely soluble with the aid of ebullition in f℥j. of pyroligneous acid diluted with f℥iss. of water; and golden crystals are abundantly deposited on cooling."

Therapeutical Effects.—The effects of this preparation are not well understood; according to some, its internal use produces the constitutional action of lead; according to others, that of iodine. In this country it is rarely given internally. Externally it is applied in the form of ointment to chronic glandular enlargements, indolent ulcers, and obstinate cutaneous affections occurring in strumous habits. It is also employed with very great benefit, as an application to cancerous tumours, for which purpose it is particularly adapted from its not producing any cutaneous irritation, and from its being more actively promotive of absorption than the other preparations of iodine.

Dose and Mode of Administration.—Gr. iij. to gr. v. made into pill with conserve of roses or extract of liquorice.—*Unguentum Plumbi Iodidi*, L. (Iodide of lead, ℥i.; lard, ℥viij.; rub together and mix). Half a drachm of this ointment may be rubbed in very gently, twice a day over cancerous or other tumours.

Incompatibles.—Sulphuric, and carbonic acids; and their salts.

### Potassii Bromidum, L.—*Bromide of Potassium.*

Preparation.—*Lond.*—"Bromine, ℥ij.; carbonate of potash, ℥ij. ℥j.; iron filings, ℥j.; distilled water, Oiij.; first add the iron, and then the bromine to Oiss. of the distilled water; set them by for half an hour, frequently stirring them with a spatula. Apply a gentle heat, and when a greenish colour occurs, pour in the carbonate of potash dissolved in the remainder of the water; strain, and wash what remains in Oij. of boiling distilled water, and again strain. Let the mixed liquors be evaporated so that crystals may be formed."

Properties.—This salt crystallizes in colourless, transparent, rectangular prisms or cubes. It is inodorous, but has an acrid saline taste; is very soluble in water, and but slightly soluble in alcohol. The crystals are unalterable in the air, exposed to heat they decrepitate, and fuse at a red heat without undergoing any change. The composition of bromide of potassium is K Br.

*Adulterations.*—If this salt contain any sulphate, it will give a white precipitate with solution of chloride of barium It is often adulterated with chloride of potassium or chloride of sodium; the following is the test given by the London College for the detection of either impurity:—"Gr. x. decompose 14·28 grains of nitrate of silver, precipitating a yellow bromide of silver which is little affected by nitric acid, but is re-dissolved by ammonia." If it decompose more nitrate of silver than the quantity above stated, it is owing to the presence of a chloride.

Therapeutical Effects.—The effects of bromide of potassium are generally stated to be analagous to those of iodide of potassium, which will be presently stated; and with this opinion, my own experience of its action, leads me completely to coincide. Dr. Williams of London employed it internally in enlargements of the spleen, in which he states that it possesses unusual, if not specific powers. But it has not

proved equally successful in the hands of other practitioners. Externally it has been employed in the form of ointment to scrofulous and indolent swellings.

Dose and Mode of Administration.—Gr. iij. to gr. xij. three times a day, dissolved in water and sweetened with syrup. For an ointment, ℈j. to ʒij. of the salt, may be combined with ʒj. of lard; if a stronger ointment, or one resembling the compound iodine ointment, be wished for, min. vj. of bromine are to be added to this.

Incompatibles.—Acids; acidulous, and metallic salts.

Potassii Iodidum, L. E. Potassæ Hydriodas, D.—*Iodide of Potassium; Hydriodate of Potash.*

Preparation.—*Dub.*—"Iodine, 1 part; sulphuret of iron, in coarse powder, 5 parts; sulphuric acid, 7 parts; distilled water, 48 parts; water of carbonate of potash, q. s.; rectified spirit, 6 parts; mix the iodine by trituration with 16 parts of the water, and put the mixture into a glass vessel. Pour the acid, previously diluted with 32 parts of water, upon the sulphuret in a matrass, and from a tube fitted to the neck of the matrass, and reaching to the bottom of the vessel containing the iodine and the water, pass the gas through the mixture until the iodine disappears. Immediately evaporate the filtered liquor with a superior heat to an eighth part, and then filter it again. Then add by degrees as much carbonate of potash as will be sufficient to saturate the acid, which is known by the cessation of the effervescence. Then expose the mixture to heat till a dry white salt is left; pour on it the spirit and dissolve with heat. Finally, pour off the liquor from the residual salt, evaporate to dryness, and preserve in well stopped bottles."—*Lond.*—"Iodine, ʒvj.; carbonate of potash, ʒiv.; iron filings, ʒij.; distilled water, Ovj.; mix the iodine with Oiv. of the water, and add the iron, stirring them frequently with a spatula for half an hour. Apply a gentle heat, and when a greenish colour occurs, add the carbonate of potash, first dissoved in the Oij. of water, and strain. Wash what remains with Oij. of boiling distilled water, and again strain. Let the mixed liquors be evaporated, so that crystals may be formed."—*Edin.*—"Iodine, (dry), ʒv.; fine iron-wire, ʒiij.; water, Oiv.; carbonate of potash (dry), ʒij. ʒvj.; with the water, iodine, and iron-wire, prepare solution of iodide of iron as directed for *Ferri Iodidum.* Add immediately, while it is hot, the carbonate of potash previously dissolved in a few ounces of water, and stir carefully, filter the product, and wash the powder on the filter with a little water. Concentrate the liquor at a temperature short of ebullition, till a dry salt be obtained; which is to be purified from a little red oxide of iron and other impurities, by dissolving it in less than its own weight of boiling water, or still better, by boiling it in twice its weight of rectified spirit, filtering the solution, and setting it aside to crystallize. More crystals may be obtained by concentrating and cooling the residual liquor."

Physical Properties.—This salt crystallizes in white, opaque, cubes or quadrangular prisms; at present generally met with in fragments of well defined cubes six to eight lines square, and having a pearly lustre. It has a pungent, saline taste, but is inodorous.

Chemical Properties.—It is composed of one equivalent of potassium and one of iodine, K I. It does not deliquesce when pure, unless there is much moisture in the atmosphere; exposed to heat it decrepitates, and fuses at a red heat, but is not decomposed. 100 parts of water at 64° dissolve 143 parts of the salt: it is soluble in 5 or 6 parts of alcohol. The watery solution is neutral when pure, it possesses the

property of dissolving iodine in large quantity, forming a brown liquid called *ioduretted iodide of potassium.*

*Adulterations.*—Iodide of potassium, as met with in the form of large cubical crystals, seldom contains any impurity. Formerly when it was not so carefully crystallized, it was very frequently adulterated with carbonate of potash. This fraud is readily detected by the alkalinity of the specimen, by its being deliquescent, and by its giving white precipitates with nitrate of baryta or with lime-water. Water is sometimes present as an impurity, it may be detected by drying the salt and ascertaining the loss of weight. If the salt contain *iodate of potash,* it becomes of a pinkish colour and emits an odour of iodine when kept for some time; its presence may be readily detected by adding tartaric acid to a solution of the salt, if any iodide be present, free iodine will be immediately developed. The freedom from chloride of potassium or of sodium, impurities not unfrequently met with, is best ascertained by the following test:—"A solution of gr. v. in fʒi. of distilled water, precipitated by an excess of solution of nitrate of silver, and then agitated in a bottle with a little aqua ammoniæ, yields quickly by subsidence a clear supernatant liquid, which is not altered by an excess of nitric acid, or is rendered merely hazy," *Edinburgh Pharmacopœia.* It has been latterly much adulterated with bromide of potassium, owing to the high price of iodine; the adulteration must be, however, looked on as one of no importance, if as I have already stated my opinion, their medicinal action be identical.

Therapeutical Effects.—Iodide of potassium is in many respects analogous in its operation to iodine; but it frequently produces very different physiological and therapeutical effects. Like iodine it is taken into the circulation, and may be detected in the different secretions and excretions, even several days after it has been swallowed. In some individuals iodide of potassium when given even in very small doses produces swelling of the face and tongue, followed by ptyalism, and this effect I have seen produced in one individual who had not taken more than ten grains of the salt. While on the other hand, many have continued its use for months without the production of iodism, or any other physiological effect whatever. In the different varieties of scrofula and in bronchocele, iodide of potassium is generally given in combination with iodine, the beneficial effects of which in these diseases it seems to increase much. In secondary syphilitic affections, few remedies are so much employed in the present day, or with so much benefit, as iodide of potassium: it is peculiarly adapted for those cases in which mercury has been administered in large quantity in the primary stage, or where the individual is of a scrofulous habit. The particular forms of secondary syphilis in which it is of most service are, sore throat, nodes, caries and other diseases of the bones, and the tubercular eruptions of the skin. This salt has been also employed with much benefit in the treatment of articular rheumatism, in chronic rheumatism with alteration of structure, in lumbago, in sciatica, in periostitis, in dropsy, in amenorrhœa, in leucorrhœa, in chronic induration and enlargement of various organs, &c. The external use of iodide of potassium in the form of ointment or of bath, is usually combined with its internal administration.

Dose and Mode of Administration.—Gr. v. to gr. xv. three times a day; to prove beneficial it must be given in full doses, increased as far as the individual can bear. It is best administered simply dissolved in water and sweetened with syrup; or in some bitter infusion, as in infusion of quassia. The power of the solution of dissolving iodine has been before referred to.—*Liquor Potassii Iodidi compositus*, L. *Iodinei Liquor compositus*, E. (Iodide of potassium, gr. x. (ʒi., E.); iodine, gr. v. (ʒij., E.); distilled water, Oj (fʒxvj., E.); mix and (with the aid of a gentle heat and agitation, E.) dissolve). Dose, L. fʒi. to fʒss.—E. min. v. to min. xv. It may be further diluted with water.—*Tinctura Iodinii composita*, L. (Iodine, ʒi.; iodide of potassium, ʒij.; rectified spirit, Oij.; macerate until they are dissolved and strain). Dose, min. x. to min. xxx, in fʒj., of any aromatic water, or in white wine.—*Unguentum Potassæ Hydriodatis*, D. (Hydriodate of potash, ℈j.; prepared lard, ʒi.; rub together and make into an ointment)—*Unguentum Iodinii compositum*, L. *Unguentum Iodinei*, E. ("Iodine, ʒss.; iodide of potassium, ʒi.; rectified spirit, fʒi.; lard, ʒij.; first rub the iodine and iodide of potassium with the spirit, then mix with the lard," L. The *Edinburgh College* omits the spirit, but uses the same proportions of the other ingredients). About the size of a nut of this ointment should be rubbed into the affected part twice or three times a day.

Incompatibles.—Acids; and acidulous, and metallic salts.

Spongia officinalis, D.—*The officinal Sponge.* Sponge is of very general use in the practice of surgery. As a medicinal agent, *burnt sponge* was used before the discovery of iodine in the treatment of bronchocele and of scrofulous affections; but as its medicinal virtues depended on the presence of that substance, it has fallen completely into disuse. The following preparation is still retained in the Dublin Pharmacopœia:—*Pulvis Spongiæ ustæ*, D. (Having cut sponge into pieces, beat it to free it from little stones; burn it in a closed iron vessel till it becomes black and friable, and reduce it to powder). Dose, ʒj. to ʒiij., made into an electuary with cinnamon and honey.

Sulphuris Iodidum.—*Iodide of Sulphur.*

Preparation.—Bruise together in a mortar 4 parts of iodine and 1 of sulphur; put the mixture into a glass matrass, and expose it to a very gentle heat; as soon as the colour deepens, and union begins to take place, augment the heat gradually until the whole is fused; cool rapidly, and preserve in well stopped vessels.

Properties.—This compound is met with in brownish plates, with a radiated crystalline structure. It has a strong odour of iodine, and an acrid taste. Its elements are easily disunited, the iodine entirely escaping when it is left exposed to the air. Its composition is $S^2I$.

THERAPEUTICAL EFFECTS.—Iodide of sulphur is not used internally in medicine. Externally in the form of ointment, it has been employed with much success in the treatment of obstinate cutaneous diseases, particularly lupus, porrigo, acne indurata, herpes, and lepra. The ointment is prepared by rubbing together from gr. xxiv. to gr. xxxvj. of the iodide and ʒi. of lard.

INCOMPATIBLES.—Acids; acidulous, and metallic salts.

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# CHAPTER XXI.

## TONICS.

(Corroborants).

TONICS are substances, the continued administration of which, in debilitated and relaxed conditions of the body, imparts strength and vigour without producing any sudden excitement. Tonics to a certain extent are stimulants, inasmuch as they arouse the vital energies, but the excitement is slowly produced, and is permanent; if, however, they are given when the system is in a healthy state, their primary action, like that of stimulants, is followed by collapse. This, then, is another example of how necessary it is to remember, that medicines are but relative agents, their effects being almost entirely dependant on the state of health or disease in which they are administered. There is no class of remedial agents which requires more discrimination in their administration than Tonics; nor any, the injudicious use of which more frequently produces evil consequences. The diseases in which this class of remedial agents are principally employed, must manifestly be those of diminished power. In no case, however, should they be prescribed where there is tendency to irritation or inflammation of the digestive organs, or where the secretions are in a depraved state, without the previous use of means calculated to remove the former or correct the latter; to effect which, the employment of mild purgatives will, in most instances, be found best adapted. Tonics have a marked action on the various organs of secretion, their effects being to restore them to a healthy state. They are consequently administered with the view of diminishing secretion when it is excessive or of restoring it when deficient, if either condition

depend, as it so frequently does, on inertia or want of tone in the secreting organ. Independently of their tonic properties, some of the remedies contained in this class possess a specific power in ague and other periodical diseases, and hence have been denominated *Febrifuges;* as examples, we may refer to Cinchona bark, Arsenic, &c.

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Absinthium, L. E. Artemisia absinthium, summitates florentes, D.—*Wormwood. The herb (flowering tops, D.) of Artemisia absinthium.* Indigenous; belonging to the Natural family *Compositæ (Asteraceæ,* Lindley), and to the Linnæan class and order *Syngenesia Superflua.*

Botanical Characters.—An undershrub, 1-1½ foot high, erect, covered with silky hoariness; Leaves, bipinnatifid, downy, segments lanceolate; Flowers in erect leafy panicles, hemispherical, drooping, large, dingy yellow.

Properties.—The whole plant is aromatic and bitter, with a strong disagreeable odour. Its most important constituents are, bitter extractive, bitter resin, and a trace of volatile oil; it yields its properties to both water and alcohol. The herb when carefully dried with a stove heat retains its aroma and bitterness for a long time.

Therapeutical Effects.—Wormwood is an excellent bitter tonic, although not much employed at present. It is well adapted for giving tone to the digestive organs in debilitated habits.

Dose and Mode of Administration.—In powder, ʒss. to ʒi.—*Infusum Absinthii,* (Wormwood, dried, ʒiss.; boiling water, Oj.; infuse for an hour and strain). Dose, fʒj. to fʒij.—*Tinctura Absinthii,* Amst. (Dry wormwood cut fine, one part; proof spirit, six parts; macerate for 6 days, express and filter). Dose, fʒij. to fʒss.—*Extractum Artemisiæ Absinthii,* D. (Prepared as the simpler extracts). In the preparation of this extract, the aroma is completely dissipated, but it still retains the bitterness of the plant. Dose, gr. x. to gr. xx.

Incompatibles.—The sesqui-salts of iron; acetate of lead; and sulphate of zinc.

Acidum muriaticum dilutum, D. E. Acidum hydrochloricum dilutum, L.—*Dilute Muriatic (Hydrochloric, L.) acid.*

Preparation.—*Dub.*—"Muriatic acid, *by measure* 10 parts; distilled water, *by measure* 11 parts; mix. Sp. gr. 1080."—*Lond. Edin.* "Hydrochloric (muriatic, E.) acid, fʒiv.; distilled water, fʒxij.; mix."

Muriatic acid (described in the division *Caustics*), properly diluted, acts as a tonic, and as such, is employed in those forms of fever which

were formerly supposed to depend on a putrescent condition of the fluids of the body, as in petechial fevers, malignant scarlatina, phagedenic ulceration of the throat, scurvy, &c. It is also an excellent tonic in debility of the digestive organs, particularly when attended with a deposit of phosphates from the urine, and in that state of the alimentary canal which favours the generation of worms. Independently of its action as a caustic, dilute muriatic acid is an excellent addition to gargles in ulcerated sore throat, when there is no tendency to inflammation present; it is also employed with much advantage in the sore throat of scarlatina.

Dose and Mode of Administration.—*Acidum Muriaticum Dilutum*, D. Gtt. xx. to gtt. xl.—L. E. f℥ss. to f℥j. It should be administered largely diluted with some bitter infusion, as infusion of quassia, or it may be substituted for sulphuric acid in preparing the infusion of roses; f℥j. to f℥ij. may be added to an eight ounce gargle.

Incompatibles.—Alkalies; tartar emetic; tartrate of potash; nitrate of silver; acetate of lead; and all carbonates.

### Acidum nitricum dilutum, D. L. E.—*Dilute Nitric acid.*

Preparation.—*Dub.*—"Nitric acid, *by measure* 3 parts; distilled water, *by measure* 4 parts; mix, avoiding the noxious vapours. Sp. gr. 1280." *Lond.*—"Nitric acid, f℥j.; distilled water, f℥ix.; mix." *Edin.*—"Mix together, f℥ix. of distilled water, and f℥j. of pure nitric acid or f℥j. f℥vss. of commercial nitric acid. Density, 1077."

Nitric acid (described in the division *Caustics*), properly diluted acts as a general tonic, but its powers as such are less manifest than those of the other mineral acids. It is principally used internally in the treatment of chronic hepatitis, in affections consequent on the excessive administration of mercury, and in secondary syphilitic diseases. In syphilis it has been proposed as a substitute for mercury, but its beneficial influence appears to be limited to those cases in which scrofula or very great debility forbid the use of that medicine, but which, as has been so ably shown by the late Mr. Colles of this city, are very few in number, and frequently depend rather on its injudicious administration.

Dose and Mode of Administration.—*Acidum Nitricum Dilutum*, D. Gtt. x. to gtt. xxx.—L. E. f℥ss. to f℥j. It may be administered in the same form as muriatic acid; but it is most usually given in the compound infusion or decoction of sarsaparilla.

Incompatibles.—Alcohol; alkalies; oxides; earths; sulphate of iron; acetate of lead; acetate of potash; and all carbonates, and sulphurets.

### Acidum nitromuriaticum, D.—*Nitromuriatic acid; Aqua regia.*

Preparation.—"Nitric acid, *by measure* 1 part; muriatic acid, *by measure* 2 parts; mix them in a vessel kept cool, and preserve the mixture in a well stopped bottle in a cold dark place."

Properties.—This liquor has a deep yellow colour, an intensely acid taste, and exhales an odour both of chlorine and nitrous acid. It is a solution of chlorine and of nitrous acid in water, (Cl $NO^4$ HO). Its most remarkable property is its power of dissolving the metals gold and platinum, by which it may be readily distinguished from other acids.

Therapeutical Effects.—This preparation was at one time employed internally in the same cases as nitric acid; but at present it is only used externally in the form of bath. Thus employed, it is a very useful remedy in chronic induration or abscess of the liver, in chronic cutaneous diseases, and in syphilitic or mercurial cachexia. When its employment has been continued for some time, it frequently causes salivation, which is to be regarded as evidence of its sanatory influence.

Dose and Mode of Administration.—Internally, gtt. x. to gtt. xx. largely diluted.—*Balneum Acidi Nitromuriatici*, (Nitromuriatic acid, fʒivss.; water, cong. iij.; mix in a wooden vessel). This is to be used daily in the form of a foot-bath; the feet should be kept in the bath for from 15 to 20 minutes, and afterwards rubbed well with flannels. Dr. Scott of Bombay affirms that this bath operates like a charm, and produces immediate ease, when employed during the passage of biliary calculi through the duct.

### Acidum phosphoricum dilutum, L.—*Diluted Phosphoric acid.*

Preparation.—*Lond.*—"Phosphorus, ʒj.; nitric acid, fʒiv.; distilled water, fʒx.; add the phosphorus to the nitric acid mixed with the water in a glass retort placed in a sand-bath, then apply heat till fʒviij. are distilled. Put these again into the retort that fʒviij. may distil, which are to be rejected; evaporate the remaining liquor in a platinum capsule, until only ʒij. ʒvj. remain. Lastly, add to the acid when it is cold, as much distilled water as may be sufficient to make it accurately measure fʒxxviij."

Physical Properties.—This is a colourless, inodorous, transparent liquid, with an intensely acid taste. Its density is 1·064 at 62° F.

Chemical Properties.—It is a solution of phosphoric acid ($PO^5$) in water; the London preparation containing 10·5 per cent of acid. It possesses the usual characteristics of a mineral acid. "Chloride of barium or nitrate of silver being added, whatever is thrown down is readily dissolved by nitric acid. Strips of copper or silver are not at all acted upon by it, nor is it coloured when hydrosulphuric acid is added; 42 grains of carbonate of soda are saturated by 100 grains of this acid, and nothing is thrown down," *London Pharmacopœia*.

Therapeutical Effects.—Diluted phosphoric acid possesses the tonic properties of the other mineral acids, and may be employed in cases of debility of the digestive organs, and in general cachexia. It is particularly adapted for those cases in which there is a deposit of phosphates from the urine; the earthy phosphates being soluble in an excess of their own acid. It has been also used, it is stated, with much benefit in cases of unusual depositions of phosphates of lime, as

in exostosis, or in the formation of bony tumours; and largely diluted as a common drink in diabetes. Diluted phosphoric acid is, however, not much used.

Dose and Mode of Administration.—Min. xx. to f3j. properly diluted.

Incompatibles.—Lime water; calcareous salts; carbonate of soda; and strychnia.

In cases of poisoning with this acid, the same treatment should be followed as in poisoning with muriatic acid, (see page 115).

Anthemis, L.E. Anthemis nobilis, flores, D.—*Chamomile; The (single,* L. E.) *flowers of Anthemis nobilis.*—Indigenous; belonging to the Natural family *Compositæ (Asteraceæ,* Lindley), and to the Linnæan class and order *Syngenesia Superflua.*

Botanical Characters.—Stem, about a foot long, procumbent; Leaves, bipinnate, a little downy; Branches, numerous, each branch terminated by a single flower, whose *disk* is yellow, at length conical, and *ray* white.

Physical Properties.—Chamomile flowers have a strong, peculiar, rather agreeable odour, and an aromatic bitter taste.

Chemical Properties.—Their most important chemical constituents are bitter extractive and volatile oil. The latter, *Oleum Anthemidis,* L. E., is obtained by the usual process of distillation. It is of a greenish-blue colour, and has the peculiar odour and the aromatic taste of the flowers. One cwt. of flowers yield from f3iss. to f3ij. of the oil. Its sp. gr. is 0·9083. It contains a hydrocarbon, and an oxidated oil, the last of which treated with potash infusion gives *valerianic acid,* (Gerhardt and Cahours). Chamomile flowers yield their active properties to both water and alcohol. The single variety of the chamomile flower should be preferred for medical purposes.

Therapeutical Effects.—Chamomile is an aromatic and bitter tonic. It was formerly in high esteem as a remedy for intermittent fever, but its employment as an internal remedy is at present restricted to those forms of dyspepsia which depend on debility or want of tone of the digestive organs; in which cases it is exceedingly useful. A concentrated infusion produces vomiting, and consequently was at one time much used to aid the action of emetics. Chamomile flowers are commonly employed for preparing warm fomentations. A strong infusion, applied cold two or three times a day is an excellent application, in simple weakness of the eyes, and in the milder forms of hemorrhoidal discharges.

Dose and Mode of Administration.—The powder is not administered, the dose would be from 3ss. to 3ij.—*Decoctum Chamæmeli compositum,* D. (Chamomile flowers, dried ℥ss.; fennel seeds, 3ij.; water, *by measure* lbi.; boil for a short time and strain). Employed as a basis for enemata, or for fomentations.—*Infusum Chamæmeli,* D. *Infusum Anthemidis,* L. E. (Chamomile, 3ij. (℥v., L. E.); boiling water, (distilled, L.), *by measure* lbss. (Oj., L. E.); infuse for 24 hours (ten min-

utes, L. E.) in a covered vessel, and strain). If taken warm it produces vomiting. The dose of the cold infusion is f℥i. to f℥ij.—*Extractum Chamæmeli*, D. *Extractum Anthemidis*, E. ("Prepared as the simpler extracts," D.—"Chamomile, ℔j.; boil it with cong. j. of water to Oiv.; filter hot; evaporate in the vapour-bath to the right consistence," E.). The volatile oil is dissipated in the preparation of this extract, but it is an excellent bitter tonic; Dose, gr. x. to ℥ss.

Incompatibles.—*With the infusion;* the mineral acids; sesqui-salts of iron; sulphate of copper; nitrate of silver; acetate of lead; and corrosive sublimate.

Argenti chloridum. *Chloride of Silver.* This salt is readily obtained by the double decomposition of solution of nitrate of silver and of chloride of sodium. When first precipitated it is white, but on exposure to light soon acquires a dark brown, almost black colour. It is insoluble in water or in alcohol, and is void of odour and taste.

Therapeutical Effects.—It has been employed both in America and on the Continent in the treatment of disease, as a substitute for the nitrate of silver. It has been also used with success as a remedy in primary and secondary syphilitic affections. It is stated not to produce the discoloration of the skin caused by the nitrate; but from its limited employment hitherto, I do not think that such a conclusion can be depended on; the more especially as it is admitted by all that the nitrate of silver is converted into the chloride immediately on its being taken into the stomach.

Dose and Mode of Administration.—Gr. iij. four or five times daily, made into pill with conserve of roses or extract of liquorice.

Argenti nitras.—*Nitrate of Silver* (described in the division *Caustics)*, may be administered internally in much larger doses than might *a priori* be supposed from its caustic action when applied to the surface of the body; from whence it would appear to be decomposed by the free acids of the stomach. Nevertheless, when taken in large quantity, it acts as a powerfully corrosive poison. In small but frequently repeated doses, this salt is an excellent tonic, and also appears to have a specific influence over some convulsive disorders. As a tonic, it is one of the best that can be employed in the early stages of tubercular phthisis; in chronic affections of the stomach, especially where there is morbid sensibility of the gastric and intestinal nerves; and in angina pectoris. The principal convulsive disorders in which nitrate of silver has been used are epilepsy and chorea, in both of which it proves very frequently successful, perhaps more so than any other remedy. Its administration must, however, be persevered in for a very long time; and this is attended with a very serious disadvantage, and one which has brought this remedy into great disrepute, namely, the communication of an indelible and permanent leaden or bluish-grey hue to the skin over the whole body. Various attempts have been made to account for this phenomenon, but none are at all satisfactory to my mind; it is certain, that this conse-

quence has occurred so frequently (I have myself seen several instances of it), and is of so disagreeable a nature, as to more than counterbalance its remedial powers.

Dose and Mode of Administration.—1-6th of a grain gradually increased to gr. ij. or gr. iij. three times a day; in some instances so large a dose as gr. xv. have been taken. It is best administered in the form of pill, as the solution blackens the skin wherever it touches it, and also acts more energetically on the stomach. The pills should be made with some vegetable extract, as extract of gentian or of chamomile; crumb of bread is frequently ordered for this purpose, but it contains chloride of sodium which decomposes nitrate of silver. To prevent the discoloration of the skin, the surest method is, not to continue the use of the medicine too long. The late Dr. James Johnson, of London, states, "that there is no instance on record where the complexion has been affected by the medicine when restricted to three months administration." Dr. A. T. Thomson has suggested the combined use of dilute nitric acid to prevent the decomposition of the nitrate; and more recently, Dr. Patterson, of Rathkeale, has proposed the employment of the iodide (prepared by precipitating a solution of nitrate of silver with a solution of iodide of potassium), instead of the nitrate of silver, which he asserts is equally efficacious as a remedy without possessing this great disadvantage.—*Liquor Argenti nitratis*, L. E. (Nitrate of silver, ʒi. (gr. xl. E.); distilled water, fʒj. (gr. 1600, E.); dissolve the nitrate of silver in the water, (and strain; then the access of light being prevented, L.), keep the solution in well closed bottles). Used only as a test.

Incompatibles.—Spring and river water; the alkalies, and their carbonates; lime water; muriatic, sulphuric, phosphoric, tartaric, and hydrocyanic acids, and their soluble salts; iodide of potassium; solution of arsenite of potash; solution of soap; and astringent vegetable infusions.

In poisoning with nitrate of silver, the best antidote that can be employed is common salt; its administration should be followed by demulcent drinks, and if inflammatory symptoms arise, the usual antiphlogistic means.

Argenti oxydum. *Oxide of Silver.* This preparation has been employed within the last few years in the same cases as nitrate of silver, over which it does not appear to possess any advantage. It is prepared by adding caustic potash or lime-water to a solution of nitrate of silver, when it is thrown down as a brown powder which becomes of a darker colour when dried. It is slightly soluble in distilled water, the solution having an alkaline reaction. Its density is 7·143; and its composition Ag O. The dose of this preparation is from gr. ss. to gr. j. three times a day in the form of pill.

Arsenicum album. *Arsenic* (described in the division *Caustics)*, is a powerful irritant poison, a few grains being sufficient to occasion death. Its effects when taken in poisonous doses vary remarkably; in some

instances the most prominent symptoms are those of inflammation of the gastro-intestinal membrane; while in others, coma and extreme depression of the circulation are most marked. When administered in minute doses for a short period, it appears to act as a general tonic, without producing any remarkable physiological effect; but, if its use be long continued, or the doses given be too large, it acts as a slow poison. In medicine, it has been principally used internally as an *anti-periodic*, in the treatment of ague, and of other diseases of an intermittent type, as in some forms of neuralgia, chorea, and periodic head-ache; and its employment in these affections is often attended with the most beneficial results, more especially in cases in which quina either disagrees with the patient or fails to cure the disease. In chronic cutaneous diseases, particularly those of a scaly character, and those which affect the scalp, arsenic is generally given in combination with iodine (see page 328), it is, however, often prescribed alone with excellent effect. It has been also employed as an internal remedy, in epilepsy; in chronic rheumatism, especially when attended with change of structure in the joints; in passive dropsy; in secondary syphilis; in lupus, &c.

Dose and Mode of Administration.—The employment of arsenic as a remedy requires great caution, and its effects must be carefully watched; it may be administered in substance in doses of from 1-16th to 1-8th of a grain made into pill with crumb of bread; but, in consequence of the great difficulty of accurately dividing so small a quantity into pills, the following preparation is generally preferred:—*Liquor Arsenicalis*, D. E. *Liquor Potassæ Arsenitis*, L. (Arsenic, powdered (broken into small fragments, L.); and carbonate of potash (from tartar, D.), of each, gr. lx. (gr. lxxx., L. E.); compound spirit (tincture, L.E.) of lavender, f℥iv. (f℥v. L. E.); distilled water, *by measure* ℔ss. (Oi., L. E.); boil the arsenic and carbonate of potash with the water (half the water, L. E.) in a glass vessel till they are dissolved, (filter if necessary, E.); add the spirit of lavender to the cooled liquor; and then, sufficient distilled water, till the whole measures ℔j. [Oi., L. E.]). One fluid drachm of this preparation, commonly known as Fowler's solution, contains gr. ss. of arsenious acid; the preparation of the Dublin College is a little weaker. Dose, min. v. to min. x. two or three times a day.—*Arsenical solution*, Devergie. (Arsenic; and carbonate of potash, of each, gr. ij,; distilled water, f℥xvj.; tincture of cochineal, sufficient to colour it; mix). Every fluid ounce contains 1-8th of a grain of arsenic. The advantage it possesses over Fowler's solution, is that the preparation being so much weaker and consequently the dose so much larger, dangerous accidents from an over dose are not so likely to occur. Either solution is incompatible in prescription with acids, lime water, chloride of calcium, sulphate of magnesia, sulphate of iron, sulphate of copper, alum, iodide of potassium, iodide of iron, nitrate of silver, infusion and decoction of bark, &c.—*Pilulæ Asiaticæ*. (Arsenious acid, ℥j.; black pepper, ℥ix.; liquorice root, powdered; and mucilage, of each, q. s.; mix, and divide into 800 pills). This combination is highly praised in the East Indies as a remedy for elephantiasis, lepra, psoriasis, and syphilitic eruptions. Each pill contains about 1-13th of a grain of arsenious acid; Dose, one to two daily.

In poisoning with arsenic, if the stomach-pump be at hand it should be immediately used, and the stomach repeatedly washed out with tepid water, in which the hydrated sesquioxide of iron is suspended. The mode of preparing this substance which is the best antidote for arsenic, and the manner in which it is to be used will be described hereafter. In the absence of the stomach-pump, emetics of sulphate of zinc or sulphate of copper should be administered, and vomiting promoted by demulcent drinks. Magnesia has been also recently proposed as an antidote for arsenic; from the observations of Christison it appears that dense or *heavy* magnesia possesses little or no action on it, but magnesia in a gelatinous state, or the *light* magnesia at present pretty generally manufactured, removes arsenic from its solution in water. If light calcined magnesia be used as an antidote in cases of poisoning with arsenic, it should be administered in the proportion of between thirty and fifty parts to one of the poison.

Aurantii cortex, L. E. Citrus aurantium, fructus tunica exterior et folia, D. *Bitter-orange rind (and leaves,* D.). *The outer rind of the fruit of Citrus vulgaris* (Risso), L. E.—*The outer rind of the fruit, and the leaves of Citrus aurantium,* D. The three British Colleges intend to refer the officinal products to the bitter-orange tree, which has been only lately separated as a distinct species from the Citrus aurantium (described in the division *Refrigerants).* It differs, in being a smaller tree with more distinctly winged leaf-stalks, in the bitterness of the pulp, and the greater aroma of the rind of the fruit.

Properties.—The rind of the Seville or bitter-orange is cut into narrow pieces and dried, the inner white part having been previously removed. It is in rugged, uneven slices, of a dark orange-yellow colour; it has a peculiar fragrant odour, and a warm, bitter taste, both of which depend on a volatile oil which exists in concave minute vesicles. It yields its aroma and taste to both water and alcohol. The leaves are aromatic and bitter, they are used on the Continent, but at present are not employed in this country.

*Adulterations.*—The rind of the sweet orange is often substituted for that of the bitter orange. It does not possess the peculiar aroma of the latter; the sophistication may be readily detected by the vesicles in which the volatile oil is contained, being convex in the sweet, and concave in the bitter orange.

Therapeutical Effects.—Bitter orange peel and leaves are feebly tonic. They are employed in medicine principally for their agreeable flavour. The following preparations are officinal.—*Infusum Aurantii compositum,* D. L. *Infusum Aurantii,* E. (Orange peel, dried, ʒij. (ʒss., L. E.); lemon peel, fresh, ʒi. (ʒij., L. E.); cloves bruised, ʒss. (ʒi., L. E.).; boiling water, (distilled, L.), *by measure* ℔ss. (Oj., L. E.). Digest for 15 minutes in a vessel lightly covered, and strain, "through linen or calico," E.). Dose, fʒj. to fʒij.; chiefly used as a vehicle for other medicines.—*Confectio (Conserva,* E.) *Aurantii,* L. E. ("Fresh orange peel, separated by a rasp, ℔j.; sugar, ℔iij.; bruise the rind with a wooden pestle in a stone mortar; then the sugar being added,

again pound them until they are thoroughly incorporated," L.—"Grate off the outer rind of bitter oranges, and beat it into a pulp, adding gradually thrice its weight of white sugar," E.). An agreeable flavouring adjunct to electuaries, syrups, &c.; it possesses stomachic and tonic properties. Dose, ʒij. to ʒi.—*Syrupus Aurantii*, D. L. E. (Fresh orange peel, ʒviij. (ʒiiss., L. E.); boiling water, *by measure* ℔vj. (Oj., L. E.); pure sugar, ℔xivss. (℔iij., L. E.); macerate the peel in the water for 12 hours in a vessel lightly covered; and then add the sugar to the liquor (filtered, D. E.); "and dissolve with the aid of heat," D. E.). A mild stomachic, used for flavouring. It may be prepared extemporaneously by adding fʒi. of the tincture to Oj. of simple syrup. Dose, fʒij. to fʒss.—*Tinctura Aurantii*, D. L. E. (Orange peel, dried, ʒiij. (ʒiiiss., L. E.); proof spirit, *by measure*, ℔ij. (Oij., L. E.); macerate for 3 (14, L. 7, E.) days and filter. "This tincture may be made by percolation, by cutting the peel into small pieces, macerating it in a little of the spirit for 12 hours, and beating the mass into a coarse pulp before putting it into the percolator," E.). Dose, fʒi. to fʒiij.

Incompatibles.—The salts of iron; and lime water.

Barytæ murias, D. E. Barii chloridum, L.—*Muriate of Baryta. Chloride of Barium.*

Preparation.—*Dub.*—"Sulphate of baryta, 10 parts; charcoal, in the finest powder, or lampblack, 1 part; roast the sulphate of baryta in the fire, and throw it while red hot into water; then reduce it to very fine powder in the manner directed for *prepared chalk*. Mix the powders intimately, put them into a crucible, and expose them for 4 hours to a strong heat, until they become red hot. Dissolve the mass when cold in a quantity of boiling distilled water, amounting to ten times the weight of the sulphate of baryta, and filter. To this, add sufficient muriatic acid to saturate the baryta, avoiding the vapours, then filter the liquor, and crystallize by evaporation and cooling." *Lond.*—"Carbonate of barytes, broken into small fragments, ʒx.; hydrochloric acid, Oss.; distilled water, Oij.; mix the acid with the water, and add the carbonate gradually. Then, heat being applied, and the effervescence finished, strain, and boil down the liquor, that crystals may be formed." *Edin.*—"First process, same as directed by the London College. Or, sulphate of baryta, ℔j.; charcoal in fine powder, ʒij.; pure muriatic acid, a sufficiency; heat the sulphate to redness; pulverize it finely when cold, and mix it intimately with the charcoal; subject the mixture to a low white heat for 3 hours in a covered crucible, pulverize the product, put it gradually into Ov. of boiling water, and boil for a few minutes; let it rest for a little over a vapour-bath; pour off the clear liquor, and filter it if necessary, keeping it hot. Pour Oiij. of boiling water over the residuum, and proceed as before. Unite the two liquors, and while they are still hot, or if cooled, after heating them again, add pure muriatic acid gradually so long as effervescence is occasioned. In this process the solutions ought to be as little exposed to the air as possible; and in the last step, the disengaged gas should be discharged by a proper tube into a chimney, or the ash-pit of a furnace. Strain the liquor, concentrate it, and set it aside to crystallize."

Physical Properties.—This salt crystallizes in flat four-sided tables, bevelled at the edges. It is colourless and transparent; odourless; with an acrid, bitter taste. Sp. gr. 2·82.

Chemical Properties.—Muriate of baryta is composed of one eq. of

barium, one of chlorine, and two of water of crystallization, Ba Cl + 2 HO. It is permanent in ordinary states of the atmosphere, but in very dry air, effloresces slightly. It is fused by a strong heat; is soluble in about twice its weight of temperate, and in somewhat less of boiling water; it is said to be soluble in 400 parts of absolute alcohol. Sulphuric acid and the soluble sulphates produce a heavy white precipitate, insoluble in nitric acid, with a solution of this salt.

*Adulterations.*—As met with in the shops, this salt is very seldom adulterated. The Edinburgh College has given the following test, by which the freedom from any impurity may be readily ascertained:—"100 grains in solution are not entirely precipitated by 100 grains of sulphate of magnesia."

Therapeutical Effects.—Chloride of barium was at one time much employed in scrofulous diseases, and in chronic glandular enlargements, in consequence of its supposed tonic and deobstruent properties. In the present day it has fallen almost completely into disuse. In large doses, (an ounce or more), it is a narcotico-acrid poison.

Dose and Mode of Administration.—It is only used in solution.—*Aqua (Solutio,* E.*) Barytæ muriatis,* D. E. *Liquor Barii chloridi,* L. (Chloride of barium, 1 part (℥i., L. E.); distilled water, 3 parts (f℥i., L. E.); dissolve the salt in the water. "Sp. gr. 1230," D.). Dose, min. v. to min. x. properly diluted. It is much employed as a test for detecting the presence of sulphuric acid and the sulphates.

Incompatibles.—Sulphuric acid; sulphates; carbonates; and phosphates.

In poisoning with this salt, the best antidotes are the soluble sulphates, as sulphate of magnesia or sulphate of soda.

Bebeerinæ sulphas. *Sulphate of Bebeerina.* Bebeerina is the active principle of Bebeeru—the bark of *Nectandra Rodiei,* the Green-heart tree of Demerara and of British Guiana, which belongs to the Natural family *Lauraceæ,* and to the Linnæan class and order *Dodecandria Monogynia.* This principle is also found in much larger quantity in the fruit of the same tree.

Preparation.—The exact steps followed in its preparation have not been published, but the process is similar to that followed for the preparation of sulphate of quina from cinchona bark.

Properties.—It occurs in small tabular, shining crystals, of a reddish-brown colour, void of odour, with a strongly astringent taste. According to Dr. Douglas Maclagan's analysis of the commercial salt it is a basic sulphate, being composed of 20·83 of bebeerina and 9·17 of sulphuric acid. It is soluble in water, but like sulphate of quina, requires the addition of a few drops of dilute sulphuric acid for its complete solution. Bebeerina is an alkaloid and combines with acids to form salts; the sulphate has been, however, as yet only used in medicine.

Therapeutical Effects.—The introduction of this new medicine into the Materia Medica, is altogether due to the researches of my friend

Dr. Douglas Maclagan of Edinburgh. It is unquestionably a *tonic* of much power, and as an *antiperiodic* its effects are but little if at all inferior to those of sulphate of quina. From a report of numerous cases in which it has been employed, and which have been published by Dr. Maclagan in the 63rd Vol. of the *Edinburgh Medical and Surgical Journal*, it appears to differ from that remedy "in not being so liable to excite the circulation or affect the nervous system;" and this conclusion is fully borne out by my own experience of its effects in some cases in which I employed it.

Dose and Mode of Administration.—Gr. j. to gr. v. three or four times a day, made into pill with conserve of roses, or dissolved in water by means of a few drops of dilute sulphuric acid.

Incompatibles.—The alkalies, and their carbonates; lime water; tartaric acid; the soluble tartrates; and all vegetable tinctures, infusions and decoctions containing tannin.

Bismuthi subnitras, E. Bismuthi trisnitras, L. Bismuthum album, E. *Subnitrate (Trisnitrate) of Bismuth. White Bismuth. Magistery of Bismuth.*

Preparation.—*Dub.*—"Bismuth, powdered, 7 parts; dilute nitric acid, 20 parts; distilled water, 100 parts; add the bismuth gradually to the acid, and dissolve with heat. Mix the solution with water, and set aside, that the powder may subside, which is to be washed with distilled water, and dried on bibulous paper with a gentle heat." *Lond.*—"Bismuth, ℥i.; nitric acid, f℥iss.; distilled water, Oiij.; mix f℥i. of the water with the nitric acid, and dissolve the bismuth in them, then pour off the solution, to this add the remainder of the water, and set by that the powder may subside. Afterwards the supernatant liquor being poured off, wash the trisnitrate of bismuth with distilled water, and dry it with a gentle heat." *Edin.*—"Bismuth, in fine powder, ℥i.; nitric acid, (Dens. 1380), f℥iss.; water, Oiij.; add the metal gradually to the acid, favouring the action with a gentle heat, and adding a very little distilled water as soon as crystals or a white powder begin to form. When the solution is complete, pour the liquid into the water, collect the precipitate immediately on a calico filter, wash it quickly with cold water, and dry it in a dark place."

Physical Properties.—This salt is met with in the form of a heavy white powder with a pearly lustre, which appears under the microscope to be composed of crystalline grains. It is inodorous and tasteless. It becomes of a grayish colour when exposed to the light.

Chemical Properties.—The composition of this substance has been variously stated; it is most generally believed to be, 3 eq. of oxide of bismuth, and 1 of nitric acid, (3 $Bi^2O^3$ (Kane), + $NO^5$); but according to some recent researches of Buchner it appears to be Bi O, $NO^5$ + 2 Bi O, HO. It is very insoluble in water, but is readily dissolved by nitric acid.

*Adulterations.*—As generally met with, this salt is free from impurities. It is said sometimes to contain carbonates, which may be detected by the effervescence produced when the powder is dissolved in nitric acid.

Therapeutical Effects.—In large doses, nitrate of bismuth acts as an irritant poison, causing inflammation of the stomach and intestines.

In medicinal doses it appears to act specifically in painful derangements of the stomach. The beneficial results derived from its use in these affections have been generally ascribed to its tonic properties; more recently, however, they are said to be owing to a peculiar sedative action which it exerts on the nerves of the stomach. The forms of dyspepsia in which it alone proves serviceable, are those chronic affections attended with much pain, but unaccompanied by organic disease. In the present day it is not, however, so much used as it formerly was.

Dose and Mode of Administration.—Gr. v. to gr. xx. made into an electuary or bolus, with some aromatic powder and syrup, or honey.

Incompatibles.—Potash, soda, ammonia, and their carbonates.

Calcis murias, D. E. Calcii chloridum, L.—*Muriate of Lime. Hydrochlorate of Lime. Chloride of Calcium.*

Preparation.—*Dub.*—"Take of the liquor which remains after the distillation of the water of caustic ammonia, any quantity, filter and expose it in an open vessel to heat, until the muriate of lime becomes perfectly dry. Preserve it in very close vessels." *Lond.*—"Chalk, ℥v.; hydrochloric acid, and distilled water, of each, Oss.; mix the acid with the water, and to these gradually add the chalk to saturation. Then the effervescence being finished, strain; evaporate the liquor until the salt is dried. Put this into a crucible, and having liquefied it in the fire, pour it upon a clean flat stone. Lastly, when it is cold break it into small pieces, and keep it in a well-closed vessel." *Edin.*—"White marble, in fragments, ℥x.; muriatic acid, of commerce; and water, of each, Oj.; mix the acid and water; add the marble, by degrees, and when the effervescence is over, add a little marble in fine powder till the liquid no longer reddens litmus; filter and concentrate to one-half; put the remaining fluid in a cold place to crystallize; preserve the crystals in a well closed bottle; more crystals will be obtained on concentrating the mother liquor."

Physical Properties.—This salt is usually met with in colourless translucent masses, but it crystallizes from a concentrated solution in long striated rhombic prisms. It is inodorous, and has an acrid, bitter, saline taste.

Chemical Properties.—Crystallized chloride of calcium is composed of one eq. of calcium, one of chlorine, and six of water of crystallization, Ca Cl + 6 HO. Exposed to the air it deliquesces rapidly; it is very soluble in water and in alcohol. By heat, the water of crystallization is driven off, and at a red heat it fuses.

*Adulterations.*—This salt should be perfectly colourless, the presence of iron with which it is occasionally contaminated giving it a yellowish tinge. The adulteration with magnesia may be detected by ammonia giving a white precipitate with a solution of the salt. In the following test the Edinburgh College has guarded against any alkaline impurity.—"A solution of 76 grains in f℥j. of distilled water, precipitated by 49 grains of oxalate of ammonia, remains precipitable by more of the test."

Therapeutical Effects.—Chloride of calcium acts as an irritant poison in large doses. In medicine, it was at one time much employed

in the treatment of bronchocele and in scrofulous diseases, being given internally, and at the same time used externally, dissolved in water, in the form of bath; its action was said by some to be tonic and deobstruent, by others cathartic. In the present day, however, it has nearly fallen into disuse. It forms a principle ingredient in many mineral waters.

Dose and Mode of Administration.—It is always administered in solution; the following is a convenient formula.—*Calcis muriatis aqua*, D.—*Calcis muriatis solutio*, E.—*Liquor calcii chloridi*, L. (Chloride of calcium (crystallized, E.), 2 parts (℥iv. L., ℥viij., E.); distilled water, 7 parts (f℥xij., L. E.); dissolve the salt in the water, (and strain, L.), "Sp. gr. 1202," D.). Dose, min. xxx. to f℥ij. diluted with water.

Incompatibles.—Sulphuric acid, and the soluble sulphates; potash and soda, and their carbonates; and carbonate of ammonia.

Calumba, L. E. Colomba, radix, D.—*Calumba; Root of Cocculus palmatus.* A native of the forests of Mozambique and Oibo in Africa; belonging to the Natural family *Menispermaceæ*, and to the Linnæan class and order *Diœcia Hexandria.*

Botanical Characters.—An annual climber; Root, perennial, tuberose; Stem, herbaceous; Leaves, alternate, cordate at the base, 5-7 lobed, somewhat hairy; Flowers, diœcious, small, green, in axillary racemes; Fruit, a drupe or berry, one-celled, one-seeded.

Preparation.—The roots are dug up in March, cut horizontally into slices and dried in the shade; the offsets or tubers from the main root only are used.

Physical Properties.—As met with in commerce, calumba root is in circular flat pieces, from 3 to 10 lines thick, and from half an inch to three inches in diameter. The pieces consist of a brownish-yellow rugous epidermis, a thick yellowish inner-bark, and a light, spongy, woody centre, of a grayish-yellow colour. The flat surfaces are depressed in the centre, and marked with concentric yellowish lines. It has a feeble, somewhat aromatic odour, and a strong purely bitter taste.

Chemical Properties.—Calumba contains a crystalline, very bitter neutral principle, which has been named *Calumbin* and on which its medicinal properties depend, about a third of its weight of starch, a trace of volatile oil, gum, wax, &c. Its bitter principle is dissolved out by cold and boiling water, by alcohol, and by ether. As boiling water dissolves out some starch, a warm infusion becomes cloudy as it cools; the Edinburgh College, therefore, employs cold water for preparing the officinal infusion, a great improvement inasmuch as the active principle is as completely extracted and the preparation is quite transparent.

*Adulterations.*—The root of a species of Bryony *(Bryonia epigæa)*, and the root of *Frasera Walteri* (American or false calumba), have been at times sold for the true calumba root. The former may be at once detected by its disagreeable, bitter, somewhat acrid taste; the latter

by its infusion becoming dark-green on the addition of a sesqui-salt of iron, an infusion of the true root remaining unchanged by the same test. Another false calumba is met with in the French drug market, which is known by its containing no starch, a cooled decoction not being affected by tincture of iodine.

Therapeutical Effects.—Calumba is an excellent bitter tonic, being slightly aromatic, but free of all astringency. It is most usefully employed in the various forms of dyspepsia, depending on want of tone in the digestive organs, and in irritability of the stomach accompanied by vomiting, when there is no tendency to inflammation present; for this latter affection it is peculiarly adapted in consequence of its property of arresting vomiting, whether it be the consequence of disease or of the administration of emetics. It is also used with much benefit to allay the sympathetic vomiting of pregnancy, and that which depends on diseases of the other abdominal viscera. The *anti-emetic* property of calumba probably depends on its active principle *calumbin*, which in addition to its action as a bitter, possesses also narcotic properties. In the advanced stages of diarrhœa and dysentery, when the use of tonics is indicated, calumba is an excellent remedy.

Dose and Mode of Administration.—In powder, gr. x. to ʒss.—*Infusum Colombæ*, D.—*Infusum Calumbæ*, L. E. ("Calumba, sliced, ʒij. (ʒv., L.); boiling (distilled, L.) water, *by measure* ℔ss. (Oj., L.); digest (macerate, L.) for two hours in a covered vessel and strain," D. L. —"Calumba, in coarse powder, ʒss.; cold water, about a pint; triturate the calumba with a little water so as to moisten it thoroughly, put it into a percolator, and transmit cold water till fʒxvj. of infusion be obtained," E.). For the reasons before stated, the Edinburgh preparation is to be preferred; it may be also prepared by simple maceration for four hours in a warm place, with constant agitation. It is usually employed as a vehicle for the more active tonics, and is given in doses of from fʒi. to fʒiij. The salts of iron, the alkalies, and their carbonates do not alter the colour of this infusion, and consequently may be advantageously combined with it in prescription.—*Tinctura Colombæ*, D.—*Tinctura Calumbæ*, L. E. ("Calumba, sliced, ʒiiss. (ʒiij., L.); proof spirit. ℔ij. (Oij., L.); macerate for 14 days and filter," D. L.—"Calumba in small fragments, (if by percolation in moderately fine powder), ʒiij.; proof spirit, Oij.; digest for 7 days; pour off the clear liquor, express the residuum strongly and filter the liquors. This tincture is much more conveniently prepared by the process of percolation, allowing the powder to be soaked with a little of the spirit for six hours before putting it into the percolator," E.). Dose, fʒj. to fʒij.—*Extractum Calumbæ*, B. (Calumba, sliced, 1 part; rectified spirit, 6 parts; digest for 2 hours at a temperature of from 86° to 104° F., and then express; pour upon the residue 2 parts of rectified spirit, digest and express as before; mix the two liquors, distil off the spirit, and evaporate to a due consistence). An excellent tonic extract; Dose, gr. v. to gr. xx.

Incompatibles.—Tincture of iodine; nitrate of silver; and the acetates of lead.

Canella, L. E. Canella alba, cortex, D.—*Canella bark*; *Bark of Canella alba.* This, the *White Wood* or *Wild Cinnamon tree* of the West Indian islands and of South America, belongs to the Natural family *Meliaceæ (Canellaceæ,* Lindley), and to the Linnæan class and order *Dodecandria Monogynia.*

Botanical Characters.—A handsome tree, 40–50 feet high; Leaves, alternate, obovate, shining, coriaceous; Flowers, small, glaucous-blue, in clusters at the extremities of the branches; Fruit, a small, bluish-black berry, generally one-celled.

Physical Properties.—Canella bark is met with in pieces of from 3-12 inches long, generally quilled, and from one to three lines thick. They are of a yellowish or pinkish-white colour, have a faint aromatic odour, and an acrid very spicy taste. This bark is often called *false Winter's bark,* as it is frequently sold for the bark of *Drymis Winteri,* hereafter to be described.

Chemical Properties.—The medicinal activity of canella bark is due to volatile oil and bitter extractive; it also contains a peculiar crystalline principle resembling *mannite* in its properties, and which has been named *Cannellin.*

Therapeutical Effects.—Canella is an aromatic tonic of some power; it is seldom employed alone in this country, but is used as an adjunct to the bitter tonics in dyspepsia. It is also combined with cathartics in debilitated states of the digestive organs, and to correct their griping qualities; Dose, in powder, gr. x. to 3ss. It enters into the composition of the *Pulvis Aloës cum Canella,* D., *of the Vinum Aloës* D. L., and of the *Tinctura* and *Vinum Gentianæ,* E.

Cascarilla, L. E. Croton cascarilla, cortex, D.—*Cascarilla bark. Bark of Croton cascarilla,* D. L.—*Probably of Croton Eleuteria, and possibly of other species of the same genus,* E. Croton Eleuteria, to which this bark is correctly referred by the Edinburgh College, is a native of the Bahamas, being found chiefly on the island of Eleuthera, whence its specific name; it belongs to the Natural family *Euphorbiaceæ,* and to the Linnæan class and order *Monœcia Monadelphia.*

Botanical Characters.—A moderate sized tree; Branches, angular, somewhat compressed; Leaves, alternate, ovate, smooth, silvery beneath; Flowers, whitish, monœcious, in compound axillary racemes.

Physical Properties.—Cascarilla bark occurs in short broken quills or flattened pieces, generally somewhat twisted. It is of a reddish-brown colour, with a whitish or reddish-yellow fissured epidermis; it is hard and breaks with a close compact fracture; it has an aromatic, bitter taste, and a peculiar agreeable odour, which becomes very fragrant when the bark is burned.

Chemical Properties.—According to the analysis of Duval, this bark contains a bitter, crystalline, neutral principle which has been named *Cascarillin,* a peculiar form of tannin, albumen, a red colouring

matter, fatty matter, wax, gum, odorous volatile oil, resin, starch, pectic acid, salts of lime and potash, and woody fibre. It yields its active properties to both water and alcohol; the colour of the infusion is deepened by the sesqui-salts of iron.

*Adulterations.*—Copalche bark, obtained from the *Croton pseudochina*, a native of Mexico, has been occasionally substituted in commerce for cascarilla bark, which it resembles much both in odour and properties. The quills are much larger than those of cascarilla bark, more completely covered with minute white lichens, and have no transverse cracks.

Therapeutical Effects.—Cascarilla is an aromatic tonic, possessing but little astringency. It is principally used as an agreeable addition to other remedies of this class in atonic dyspepsia, in the advanced stages of diarrhœa and dysentery, and in convalescence from fevers or other acute diseases. It has been also employed in intermittents as a substitute for cinchona bark, and it is stated with great success

Dose and Mode of Administration.—In powder, gr. x. to ʒij.—*Infusum Cascarillæ*, D. L. E. (Cascarilla bark, bruised, ℥ss. (℥iss., L. E.); boiling (distilled, L.) water, ℔ss. (Oj., L. E.); digest (macerate, L., infuse, E.) for 2 hours in a covered vessel and strain "through linen or calico," E.). Dose, f℥j. to f℥ij. An agreeable vehicle for more active medicines.—*Mistura Cascarillæ composita*, L. (Infusion of cascarilla, f℥xvij.; vinegar of squill, f℥i; compound tincture of camphor, f℥ij.; mix). "A combination which is of use in chronic affections of the mucous membrane of the lungs," Phillips. Dose, f℥j. to f℥iss. two or three times a day.—*Tinctura Cascarillæ*, D. L. E. (Cascarilla bark, in coarse (moderately fine, E.) powder (bruised, L.), ℥iv. (℥v. L. E.); proof spirit, *by measure* ℔ij. (Oij., L. E.); macerate for 7 (14, L.) days and filter. "Proceed by percolation or digestion as directed for tincture of cinchona," E.). Dose, f℥i. to f℥ss.

Incompatibles.—Lime water; sulphate of iron; sulphate of zinc; tartar emetic; nitrate of silver; and acetate of lead.

Centaurium, L. E. Erythræa centaureum, folia, D.—*Common Centaury. Leaves (the herb,* L., *the flowering heads,* E.*) of Erythræa centaurium.* Indigenous; belonging to the Natural family *Gentianaceæ*, and to the Linnæan class and order *Pentandria Monogynia.*

Botanical Characters.—Annual, 8-10 inches high; Stem, nearly simple; Leaves, ovato-oblong, in distant pairs; Flowers, handsome, rose-coloured, in corymbose panicles near the top of the stem.

The whole of this plant is odourless, but has a strong purely-bitter taste. It should be collected when in flower, and dried with a stove heat; all parts of the plant except the flowers contain bitter extractive, the Edinburgh College is therefore incorrect in directing the flowering heads to be used. It imparts its properties, which depend on the bitter extractive, to boiling water. The common centaury is scarcely ever used

in the present day, except as a domestic remedy; nevertheless, it forms an excellent indigenous substitute for gentian. It is best given in the form of infusion, (prepared with ℥ss. of the dried herb, and f℥xij. of boiling water), in doses of f℥i. or f℥ij.

Cetraria, L. E. Cetraria Islandica, planta, D.—*Liverwort. Iceland-moss.* Cetraria Islandica is a native of the northern parts of the British Isles and of the colder regions of both the New and Old Worlds. It belongs to the Natural family *Lichenaceæ (Lichenales,* Lindley), and to the Linnæan class and order *Cryptogamia Algæ.*

Botanical Characters.—*Thallus* foliaceous, erect, tufted, laciniated, channelled, dentato-ciliate; *Apothecia,* brown, appressed, flat, with an elevated border.

Physical Properties.—As met with in the shops, Iceland moss is greyish or brownish-white, silvery; it has a faint peculiar odour, and a mucilaginous somewhat bitter taste.

Chemical Properties.—It is composed of 80·8 per cent of a starchy matter *(lichenin),* 3 per cent of bitter principle *(cetraric* acid), with uncrystallizable sugar, gum, extractive, colouring matter *(Thallochlor),* some salts, and amylaceous fibre. By maceration in cold water the bitter principle is extracted, and the water acquires a brownish colour. By boiling in water about 65 per cent is dissolved, and when sufficiently concentrated, the liquid cools into a firm jelly.

Therapeutical Effects.—Iceland moss is a mild bitter tonic, and as it is also nutritive, it forms an excellent article of diet in diseases of debility, and in convalescence from acute diseases. It is used also as an article of food, the bitter principle having been previously removed by maceration in cold water or in a weak alkaline ley, (water 300 parts, and carbonate of potash 1 part); but when its tonic powers are required, the bitter principle should not be removed as is frequently done.—*Cetraric acid* is the tonic principle of Iceland moss, it has been obtained in a separate state by the process described below, and has been used in Italy with much success as a substitute for sulphate of quina.

Dose and Mode of Administration.—*Decoctum Lichenis Islandici,* D. *Decoctum Cetrariæ,* L. (Iceland moss, ℥ss. (℥v., L.); boiling water, *by measure* ℔j. (Oiss., L.); "digest for two hours in a close vessel, then boil for 15 minutes and strain the liquor while hot," D. "Boil down to Oj. and strain," L.). Dose, f℥j. to f℥iv.—*Cetraric acid.* (Iceland moss, coarsely powdered, any quantity; digest in rectified spirit as long as it acquires a bitter taste; distil off the greater part of the spirit and filter while hot. The impure cetraric acid which is deposited as the liquor cools, may be purified by redissolving in boiling alcohol and crystallizing). Dose, as a febrifuge, gr. ij. to gr. v. every three hours. Sixteen grains thus given in divided doses, are said to be sufficient to check the return of the fit in ague.

Incompatibles.—Potash; the salts of lead and of copper; the sesquisalts of iron; and iodine.

Chiretta, E.—*Chiretta or Chirayta. The herb and root of Agathotes chirayta.* A native of the northern parts of the Continent of India; belonging to the Natural family *Gentianaceæ*, and to the Linnæan class and order *Pentandria Monogynia.*

Botanical Characters.—Annual; Stems, smooth, jointed, branched, erect, about 3 feet high; Leaves, opposite, amplexicaul, very acute; Flowers, yellow, very numerous, stalked, in terminal panicles.

Preparation.—The whole plant is pulled up at the time the flowers begin to decay, and dried in the sun for use. It is imported in bundles tied with strips of cane, and packed in large chests.

Physical Properties.—As met with in the shops, chiretta consists of the root, stems and branches. The stems are round and smooth, about the thickness of a writing pen, with a shining brown epidermis, and a yellow spongy pith. The whole plant has a purely bitter, not unpleasant taste, without any astringency.

Chemical Properties.—Chiretta is composed of resin, yellow bitter matter, brown colouring matter, gum, malic acid, salts of potash and lime, and traces of oxide of iron, *(Lassaigne* and *Boissel).* It yields its bitterness to water and to alcohol.

*Adulterations.*—Bundles of another plant, bearing some resemblance to chiretta, are sometimes found mixed with it in the chests in which it is brought to this country; they may be however readily detected as they do not possess the least bitter taste.

Therapeutical Effects.—Chiretta is a powerful, purely bitter tonic, bearing much resemblance to gentian. Under its use the bowels are relaxed and the secretion of bile promoted; it is therefore peculiarly adapted as a tonic for dyspepsia accompanied by constipation It is much employed in the East, where its febrifugal properties are held in high estimation by the European practitioners, who use it instead of cinchona when the latter is not to be procured.

Dose and Mode of Administration.—In powder, a bad form, gr. x. to gr. xx.—*Infusum Chirettæ,* E. (Chiretta, ʒiv.; boiling water, Oj.; infuse for two hours and strain through linen or calico). This infusion would be better prepared by using double the quantity of chiretta, and employing cold water. Dose, fʒi. to fʒij.—*Tinctura Chirettæ.* (Chiretta, ʒij.; proof spirit, fʒxvj.; macerate for 7 days and filter). Dose, fʒj. to fʒij.

Chondrus crispus.—*Carrageen or Irish moss.* This substance consists of this and many allied species, dried and bleached in the sun. For medical use it is principally gathered by the peasantry on the South-West coast of Ireland. As commonly met with it is of a yellowish-white colour, dry and very crisp; in most of its properties it resembles Iceland moss, but is more mucilaginous and less bitter. It forms a somewhat similar jelly with boiling water or milk, and is frequently used as a substitute for that substance. Dr. Frank of Wolfenbuettel recommends the following compound powder of Irish moss as a diet for phthisical patients, and for children affected with *tabes mesenterica*:—

Take of, Carragheen moss, cleaned, ℥ss.; spring water, f℥xvj; boil down to one-half, strain with expression, and add to the strained liquor, white sugar, ℥iv.; gum-arabic, powdered, ℥i.; and powdered orris-root, ʒss.; heat to dryness with a gentle temperature, stirring constantly so as to obtain a pulverulent mass, to which ℥iij. of arrow-root are to be added with trituration. A jelly is prepared with this powder, by rubbing a tea-spoonful of it with a little cold water, and then pouring a cupful of boiling water on it. It has a most agreeable odour and taste, and is highly nutritious.

Cinchona flava, D. E. Cinchona cordifolia, L.—*Yellow Cinchona Bark. Bark of Cinchona cordifolia,* D. L.—*of an unascertained species of Cinchona,* E.

Cinchona rubra, D. E. Cinchona oblongifolia, L.—*Red Cinchona Bark. Bark of Cinchona oblongifolia* (Zea), D.—*of Cinchona oblongifolia* (Lambert), L.—*of an unascertained species of Cinchona,* E.

Cinchona officinalis, D. Cinchona lancifolia, L. Cinchona coronæ, E.—*Pale Cinchona Bark. Crown Bark. Bark of Cinchona lancifolia,* D. L.—*of Cinchona condaminea,* E.

Cinchona cinerea, E.—*Gray Bark. Silver Bark. Bark of Cinchona micrantha.*

Much confusion still exists as to the Natural History of the Cinchona barks, and the more recent investigations have proved that the Botanical references of the Dublin and London Colleges are altogether erroneous. The exact species from which the yellow and red barks of the pharmacopœias are obtained have not been yet determined; but crown bark (pale bark, D. L.) is undoubtedly the produce of *Cinchona Condaminea,* as also is silver bark of *Cinchona micrantha.* All the cinchona trees are inhabitants of the Andes, growing at different elevations from 1200 to 10,080 feet above the level of the sea, and in the region extending from 11° N. latitude to 20° S. latitude. They belong to the Natural family *Cinchonaceæ,* and to the Linnæan class and order *Pentandria Monogynia.*

Botanical Characters.—Trees or tall shrubs; Leaves, shortly petioled with plain margins; Stipules, ovate or oblong, foliaceous, free, deciduous; Flowers, white or rose-coloured, in terminal corymbose panicles; stamens, included within the tube of the corolla; Capsule, ovoid, elongated, crowned with the teeth of the calyx, 2-celled, 2-valved, containing many winged seeds.

Preparation.—Bark-peeling, as it is termed in South America, is practised by the native Indians; the bark of the entire tree both stem and branches is removed, the trees being in general previously cut down; it is then dried with great care so as to preserve its bright colour, the larger and thicker pieces being dried so as to form flat pieces, the smaller being allowed to curl into quills. The epidermis with the lichens, which naturally grow on it, is carefully preserved on the bark, but if it be very coarse or injured it is frequently removed. Bark-peeling occupies the entire of the dry season from May to November.

Physical Properties.—It would be quite foreign to the scope of

this work to enter into any detailed account of the numerous varieties of cinchona bark which are occasionally met with in commerce. I shall only describe those which most frequently occur, and which are most generally used for medical purposes; and in so doing I shall adopt the classification of the Dublin College, more especially as it is generally followed in the English drug trade: namely, *Yellow, Red, and Pale Cinchona barks.*

1st—Yellow Bark, *Cinchona flava.* The botanical origin of this bark, *the China regia* of Von Bergen, is as before remarked yet unknown. It is met with in two varieties, *quilled* and *flat.* The *quills* are generally from 9 to 18 inches long, from half an inch to two inches in diameter, and from one to six or seven lines in thickness. They are in general singly quilled, and coated with a very rough light-gray epidermis; externally they are marked with longitudinal wrinkles, and traversed with horizontal fissures often extending completely round the quills; and large patches of grayish-white lichens are usually adherent. Internally, they are smooth and of a cinnamon-brown colour. The *flat* pieces are from 8 to 18 inches long, from one to four inches broad, and from one to five lines thick; they are in general freed of their epidermis, but when present it is similar to that of the quilled bark. The colour is reddish-brown externally and cinnamon-brown within. Both sorts break with a fibrous, splintery fracture, and yield an orange-yellow powder. They have a faint aromatic odour, and an aromatic, bitter, somewhat astringent taste. An account of the cryptogamic plants which are found on this and the other sorts of cinchona bark has been given by Fée and by Zenker, and an attempt made to distinguish the different barks according to the species which predominate on each, but it is much too refined and difficult for practical purposes. Yellow bark is imported in serons and chests from Arica, a seaport of Bolivia.

2nd—Red Bark, *Cinchona rubra.* The species from which this bark, the *China rubra* of Von Bergen, is obtained is as yet unknown. It occurs in quills and in flat pieces. The *quills* are from 3 to 15 inches long, from two lines to an inch and a quarter in diameter, and from half a line to two lines thick. Externally they are of a reddish-brown colour (the smaller quills are grayish-brown); they are usually rough, wrinkled, and furrowed; and have a few scattered patches of grayish-white lichens. The *flat* pieces are from two inches to two feet in length, from one to five inches in breadth, and from a third of an inch to three-quarters of an inch in thickness; they are seldom quite flat, being generally somewhat convex. The epidermis is seldom absent, it is of a reddish or chesnut-brown colour, rough, wrinkled, and usually warty. The inner surface of both sorts is fibrous, and of a reddish-yellow or reddish-brown colour, the thickest pieces being the darkest coloured. The transverse fracture is fibrous and splintery, and the powder is pale reddish-brown. Red bark has a feebly aromatic, somewhat earthy odour, and a bitter, strongly astringent taste. It is imported in chests, never in serons; good red bark is now scarce in the English market, when met with genuine it is much esteemed and bears a high price.

3rd—Pale Bark, *Cinchona corona,* E. This bark, which is at present generally called Crown or Loxa bark, the *China loxa* of Von Bergen,

is the produce of the Cinchona condaminea of Humboldt and Bonplandt. It is always met with in the form of quills, never in flat pieces. These quills are simple or double, from six to fifteen inches long, from two lines to an inch in diameter, and from one-fourth of a line to two lines thick. The epidermis is always present, it is furrowed with numerous transverse fissures or cracks, and frequently also with longitudinal splits. Externally, the bark is of a pale grayish-brown colour, and covered with a great number of small whitish and ash-coloured lichens. Internally it is smooth and of a pale cinnamon-brown colour; its fracture is fibrous, and it yields a paler coloured powder than either yellow or red bark. The odour and taste are nearly similar to those of red bark. The fourth variety of bark which is officinal in the Edinburgh pharmacopœia is also a pale bark, and whenever met with, at least in the Dublin market, is sold under that name; it is rather scarce at present, but is a very good bark; it may be readily distinguished from other barks by the edges of the most perfect quills being cut obliquely. Both these varieties of pale bark are imported in chests and in serons, and are often mixed together in the same package.

Several other varieties of Cinchona bark, although not officinal, are frequently met with in commerce, and are many of them of good quality; a detailed account of them will be found in the recent works of Pereira and of Christison. The so-called *false cinchona barks* will be considered under the head of *adulterations*.

Chemical Properties.—According to the analysis of various chemists, more especially those of Pelletier and Caventou, cinchona barks appear to consist of two peculiar alkaloids—*quina* and *cinchonia*, in combination with a peculiar acid—*kinic* or *cinchonic acid*, together with a variety of tannin, two peculiar colouring matters—*cinchonic red* and *cinchonic yellow*, green fatty matter, kinate of lime, starch, gum, ligneous fibre, and a trace of volatile oil. The proportion of these ingredients, particularly the alkaloids, differs remarkably in the various kinds of bark, thus *quina* predominates in yellow bark, *cinchonia* in pale bark, while they are contained in nearly equal proportions in red bark. The medicinal properties of bark depend principally on the alkaloids, of which *quina* is the more active; it is officinal in the London pharmacopœia, but no process is given for its preparation, nor is it employed in medicine. A salt of quina, however, the disulphate, is in very general use as a substitute for cinchona bark; it is officinal in the three British pharmacopœias and is prepared as follows:—

Quininæ sulphas, *Dub.*—"Yellow cinchona bark, in coarse powder, ℔iv; distilled water, *by measure* ℔viij.; dilute sulphuric acid, ℥ij.; mix, and digest together for four hours in a proper vessel with a superior heat, frequently agitating, then strain; mix what remains of the bark with an equal quantity of water and strain; repeat the process a third time. Add to the mixed liquors sufficient fresh-burnt and slaked time to saturate the acid; separate the precipitate by means of a paper filter, and add to it ℔iij. *by measure*, of rectified spirit; digest for 6 hours with frequent agitation and filter; digest the residual power with an equal quantity of rectified spirit and filter; repeat the process a third time. Evaporate the mixed spirituous liquors nearly to dryness in a water-bath. To the residuum add by degrees sulphuric acid till the acid is slightly in excess. Then crystallize by evaporation and cooling."—Quinæ disulphas, *Lond.*—"Yellow bark, bruised, ℔vij.; sulphuric acid, ℥ix; purified animal

charcoal, ℥ij.; hydrated oxide of lead; solution of ammonia; and distilled water, of each, q. s.; mix ℥iv. ℥ij. of the acid with cong. vj. of distilled water, and add the bark to them; boil for an hour and strain. In the same manner again boil what remains in acid and water, mixed in the same proportions, for an hour and again strain. Lastly boil the cinchona in cong. viij. of distilled water for 3 hours, and strain. Wash what remains frequently with boiling distilled water. To the mixed liquors add oxide of lead while moist, nearly to saturation. Pour off the supernatant liquor, and wash what is thrown down with distilled water. Boil the liquors for a quarter of an hour, and strain; then gradually add solution of ammonia to precipitate the quina. Wash this until nothing alkaline is perceptible. Let what remains be saturated with the rest of the sulphuric acid, diluted. Afterwards digest with ℥ij. of animal charcoal, and strain. Lastly, the charcoal being thoroughly washed, evaporate the liquor cautiously that crystals may be produced."—QUINÆ SULPHAS, *Edin.*—"Yellow bark, in coarse powder, ℔i.; carbonate of soda, ℥viij.; sulphuric acid, f℥ss.; purified animal charcoal, ℥ij.; boil the bark for an hour in Oiv. of water, in which half the carbonate of soda has been dissolved; strain and express strongly through linen or calico; moisten the residuum with water and express again; and repeat this twice Boil the residuum for half an hour with Oiv. of water and half the sulphuric acid; strain, express strongly, moisten with water, and express again. Boil the residuum with Oiij. of water, and a fourth part of the acid; strain and squeeze as before. Boil again the residuum with the same quantity of water and acid, strain and squeeze as formerly. Concentrate the whole acid liquids to about a pint; let the product cool; filter it; and dissolve in it the remainder of the carbonate of soda. Collect the impure quina on a cloth, wash it slightly, and squeeze out the liquor with the hand. Break down the moist precipitate in Oj. of distilled water, add nearly f℈j. of sulphuric acid, heat it to 212°, and stir occasionally. Should any precipitate retain its gray colour, and the liquid be neutral, add sulphuric acid drop by drop, stirring constantly till the gray colour disappears. Should the liquid redden litmus, neutralize it with a little carbonate of soda. Should crystals form on the surface add boiling distilled water to dissolve them. Filter through paper, preserving the funnel hot, set the liquid aside to crystallize; collect and squeeze the crystals; dissolve them in Oj. of distilled water heated to 212°; digest the solution for 15 minutes with the animal charcoal, filter, and crystallize as before. Dry the crystals with a heat not exceeding 140°. The mother liquors of each crystallization will yield a little more salt by concentration and cooling."

The quantity of *disulphate of quina* obtained from yellow-bark varies with the quality of the bark, the average may be stated to be from $1\frac{1}{2}$ to 3 per cent. It occurs in very fine, needle-like, silky crystals, of a perfectly white colour; they are flexible, inodorous, and have a very bitter taste. Exposed to air they effloresce slightly; by a moderate heat they are fused, and by a red heat are decomposed. Sulphate of quina requires for its solution 740 parts of cold, but only 30 of boiling water; it is soluble in 80 parts of cold alcohol (sp. gr. ·850), and in much less of boiling alcohol; it is very soluble in diluted sulphuric acid. It is composed of 2 eq. of quina ($C^{20}H^{12}O^2N$), 1 of sulphuric acid, and 8 of water.

In the preparation of sulphate of quina by any of the processes that have been hitherto employed, the mother liquor that is left has a strongly bitter taste, and on the addition of an alkaline carbonate deposits a yellowish white or brownish precipitate, which on being washed with water and gently heated agglutinates into a resinous looking mass. This resinous substance was named by Sertuerner who first discovered it *Quinoidine*, and was found by him, as well as by others who employed it in medicine,

to possess properties but little inferior to sulphate of quina. Liebig has more recently investigated this matter, and has found that the so-called *quinoidine*, is uncrystallizable or *amorphous* quina, combined with various inert substances. From these, the *amorphous quina* has been separated; it is identical in chemical composition with, and has the same atomic weight as, quina, from which it appears to differ only in form—that is to say, it cannot be made to assume a crystalline appearance. *Amorphous quina* is completely soluble in dilute sulphuric acid and in alcohol, and combines with the various acids to form salts.

*Quina* is most readily obtained by precipitating a solution of the disulphate with ammonia; when it occurs in the form of a snow-white amorphous powder, which may be readily obtained in the form of delicate silky needles, by dissolving it to saturation in boiling alcohol, and cooling the solution very slowly; it is void of odour, has an extremely bitter taste, and is strongly alkaline It requires for its solution 200 parts of boiling water, but is very soluble in alcohol and in ether. *Cinchonia* may be obtained from pale bark, by a similar process to that for the preparation of quina from yellow bark. It crystallizes in colourless prisms, is inodorous, and has a feebly bitter taste. It requires 2500 parts of boiling water to dissolve it, is but slightly soluble in cold ether, and is much less soluble in alcohol than quina; in other respects it bears much resemblance to that alkaloid. Its composition is $C^{20}H^{12}N\,O$. The other substances of which cinchona bark is composed, are unimportant in a medicinal point of view. A third alkaloid, which was named by its discoverers *aricina*, was found by Pelletier and Caventou in Arica or Cuzco-bark. Gum is found only in the pale barks.

The active constituents of cinchona bark are extracted by water, alcohol, proof spirit, and the dilute acids. Of these the acids much diluted, and proof spirit are the best solvents. Boiling water dissolves out the active principles more completely than cold water, but continued boiling, as in preparing the decoction, causes the red colouring matter to form a very insoluble compound with the alkaloids. The action of various re-agents on the infusion of cinchona bark, has been proposed as a means of ascertaining the medicinal value of the different varieties; but the results obtained by those, who have published their experiments, are so dissimilar, that it is unnecessary to give any account of them here.

*Adulterations.*—The principal frauds that are practised with reference to cinchona bark, are, the substitution of the inferior true barks for the finer sorts; the admixture of bark which has been exhausted by successive macerations and then dried, with good bark; and the substitution of the so-called *spurious* or *false cinchona barks* for the true barks. Of the false barks, three in particular have been described, namely, Piton bark, Caribean bark, and Pitaya bark. They have all a disagreeable bitter taste, not aromatic: the latter only has been met with in British commerce, it occurs in quills, thin, compact, grayish-yellow externally, blackish-brown internally. A class of barks called on the continent, *white cinchonas*, but always looked on in the British market as *spurious* or *false cinchonas*, are often met with, mixed with the officinal barks. They are distinguished by the epidermis being whitish or pale yellowish, micaceous, smooth or not cracked, and adherent to the cortical layers.

The other adulterations which have been mentioned above, are very difficult to discover, as great experience is required to judge of the quality of bark (especially if in powder), by its physical properties. Of the quality of yellow bark, the best characteristic is,—the quantity of the alkaloid quina which it yields when treated by the processes of the pharmacopœias; but as they are difficult of application on the small scale, the Edinburgh College has given the following test, by which the greater part of the alkaloid contained, is readily procured in an impure state:—"A filtered decoction of 100 grs. in f℥ij. of distilled water gives, with f℥i. of concentrated solution of carbonate of soda, a precipitate, which, when heated in the fluid becomes a fused mass, weighing when cold two grains or more, and easily soluble in solution of oxalic acid." Manufacturers of the disulphate of quina generally, however, employ the test proposed by Guibourt, by which, the quantity of lime contained in the specimen is ascertained, for it has been found that those barks which are most rich in quina also contain most lime; the process is as follows:—"Mix the bark in fine powder with water, so as to form it into a fine paste, place this on paper, filter and add sulphate of soda to the filtered liquor as long as the white sulphate of lime is precipitated." According to Berzelius, the most efficacious barks are those which contain most tannin; and consequently, those which in infusion give the largest precipitate with solution of gelatin and with tartar emetic, should be preferred; and this test is applicable to all sorts of cinchona bark. Powdered cinchona bark is often adulterated with *red-saunders wood* in fine powder; the fraud may be easily detected by agitating the suspected specimen either with oil of turpentine or sulphuric ether: if it be thus adulterated it will communicate a saffron colour to either of these liquids after a few minutes, but the pure bark has no effect on them.

*Disulphate of quina* is very liable to adulteration; the substances which are generally employed for this purpose are, sulphate of lime, gum, sugar or mannite, starch, fatty matters, and sulphate of cinchonia. By the application of the tests of the Edinburgh pharmacopœia the freedom from any of these impurities, except that with the salt of cinchonia will be ascertained:—"A solution of gr. x. in f℥j. of distilled water, and two or three drops of sulphuric acid, if decomposed by a solution of ℥ss of carbonate of soda in two waters, and heated till the precipitate shrinks and fuses, yields on cooling a solid mass, which when dry weighs 7·4 grains, and in powder dissolves entirely in solution of oxalic acid." The presence of a salt of cinchonia, from which, in the present day, but few specimens are free, may be detected by precipitating, with ammonia, a solution of the salt in water, collecting the precipitate and boiling in rectified spirit; if any cinchonia be present it will be deposited in crystals as the liquor cools. *Salicin* and *caffeïn* are stated to be frequently employed on the continent of late years for the adulteration of disulphate of quina, the latter is too dear in this country to be used for that purpose; the presence of the former may be discovered by the addition of a few drops of sulphuric acid, if any salicin be present it will be changed to a bright red colour, but no effect is produced on pure disulphate of quina.

The preparation of *amorphous quina*, has been made the subject of a patent in England, nevertheless, from observations which have been made on

it, what has been hitherto offered for sale, does not appear to be quite pure. Liebig gives the following simple test for ascertaining its purity:—Completely soluble in dilute sulphuric acid and in alcohol; the solution in a dilute acid yields upon precipitation by means of ammonia, exactly the same amount of precipitate as the weight of the substance originally dissolved in the acid.

Therapeutical Effects.—The topical action of cinchona bark is astringent, anti-septic, and somewhat irritant; its general effects on the system, especially when given where debility exists, are eminently tonic; and when administered in certain states of disease, it is anti-periodic, that is to say, it possesses the power of checking diseases which recur at regular intervals, as ague, remittent fever, and periodic neuralgia. The cinchona alkaloids, without its astringency, possess the other properties of bark in a concentrated degree, and consequently since their discovery have been substituted to a great extent for the drug itself. Of the two alkaloids it has been a very generally received opinion, that quina is much more active than cinchonia, and consequently the use of the latter has been very restricted; recent experience, however, particularly on the continent, goes far to establish the almost equal activity of cinchonia, indeed, according to some, while equally energetic as a tonic and anti-periodic, it is less irritant. Most practitioners, however, are of opinion that neither of the alkaloids possesses the same medicinal properties as cinchona bark, more especially in the treatment of intermittent diseases; but if reliance can be placed on the statements of those who have employed it, the *amorphous quina* of Liebig above described, is identical in action with the bark itself.

As a topical agent, bark has been used in the form of powder or decoction as an application to foul ulcers with excessive discharge, and to mortified parts; but for this purpose it is inferior to many of the vegetable substances contained in the division *Astringents* (see chapter 4). As an internal remedy, bark is the most highly esteemed and most generally employed tonic in the whole Materia Medica. Its employment is indicated in all cases of debility, unaccompanied by any tendency to inflammation or to active hemorrhage, and provided also the stomach and digestive organs be not in an irritable condition. It is found peculiarly serviceable in those forms of debility with great laxity of the solids, which depend on, or are attended with, profuse discharges from the secreting organs. In the debility attendant on convalescence from acute diseases, cinchona and its alkaloids are also found most efficacious tonics, but they should be at first administered with great caution, as any over-excitement is apt to cause a recurrence of the febrile or inflammatory symptoms. The principal use, however, of bark (or of the preparations of quina), is as an antiperiodic. In all diseases assuming an intermittent or remittent type, it is found to be the most efficacious remedy, which has been as yet discovered; but its *modus operandi* in the cure of these maladies is so obscure, that it is in general said to be *specific*. Bark and the preparations of quina are best administered during the stage of intermission or remission, and given in as full doses as the stomach can bear, for it is essential to their beneficial influence that vomiting or purging be not produced. If there be irritability of the stomach or inflammatory ten-

dency present, they should be previously removed by appropriate treatment; and indeed in most cases of intermittent fever, the administration of an emetic and purgative, previous to the employment of cinchona or its alkaloids, will be found serviceable. In neuralgic affections, in rheumatism, head-ache, amaurosis, stricture, &c., recurring at regular intervals, bark is found equally efficacious as in intermittent fever. It is also employed with much benefit in some inflammatory affections, when they occur in the old and debilitated, as in subacute rheumatism, in scrofulous ophthalmia, &c. Disulphate of quina given in large doses frequently repeated, has been in many instances found productive of much benefit in the treatment of tetanus; and it is now much used in France, in doses of from one to three scruples, repeated three or four times a day, as a remedy for acute rheumatism. In all the diseases above enumerated, unless where an astringent effect is required, the cinchona alkaloids may be used, and they are preferred by many to the bark itself. The principal advantages which they possess, are their much greater energy and the little tendency which they have to produce irritability of the stomach.

Dose and Mode of Administration.—Cinchona bark is seldom given in the form of powder in the present day; the dose as a tonic, is from gr. x. to ʒij. two or three times a day; as an antiperiodic, from ʒi. to ʒij. every second or third hour, but few stomachs can bear such large doses. Its taste is best concealed by milk, with which, however, it should not be mixed until immediately before it is taken.—*Infusum Cinchonæ*, D. L. E. ("Pale bark, in coarse powder, ℥j.; cold water, f℥xij.; triturate the bark with a little of the water, and during trituration pour on the remainder; macerate for 24 hours frequently agitating and pour off the clear liquor," D.—"Pale bark bruised (any species of cinchona according to prescription, in powder, E.), ʒi.; boiling (distilled, L.) water, Oj.; macerate (infuse, E.) for 6 (4, E.) hours in a covered vessel, and strain [through linen or calico, E.]," L. E.). This preparation is a mild stomachic and tonic, principally employed in dyspepsia and in the milder forms of debility. The Dublin infusion may be prepared in eight hours provided constant trituration be used; it is peculiarly adapted for those cases in which there is great irritability of the digestive organs. Dose, f℥i. to f℥iij.—*Decotum Cinchonæ*, D. L. E. (Pale (Pale, Yellow, or Red, L. Crown, Gray, Yellow, or Red, E.) cinchona bark in coarse powder (bruised, L. E.), ℥j. (ʒx., L.); water (distilled, L.), q. s. (Oj. L., f℥xxiv., E.); "make a decoction which shall yield when filtered, lbj. *by measure*," D. "Boil for 10 minutes in a lightly covered vessel, and strain the liquor while hot," L. "Boil for 10 minutes, let the decoction cool, filter it and evaporate to f℥xvj.," E.). Dose, f℥i. to f℥ij.—*Tinctura Cinchonæ*, D. L. E. ("Pale (Yellow, L.) cinchona, in coarse powder (bruised, L.), ℥iv. (℥viij., L.); proof spirit, *by measure* lbij. (Oij., L.); macerate for 7 (14, L.) days and filter," D. L.—"Yellow bark, in fine powder, or any other species of cinchona according to prescription, ℥viij.; proof spirit, Oij.; percolate the bark with the spirit, the bark being previously moistened with a very little spirit, left thus for 10 or 12 hours, and then firmly packed in the cylinder. This tincture may also be prepared, though much less expeditiously, and with much greater loss by

the usual process of digestion, the bark being in that case reduced to coarse powder only," E.). Dose, f℥i. to f℥iij.—*Tinctura Cinchonæ composita*, D. L. E. (Pale (Yellow, E.) cinchona bark, in coarse powder (or fine if percolation be followed, E., bruised, L.), ℥ij. (℥iv., L. E.); bitter-orange peel, dried (bruised, E.), ℥ss. (℥iij., L. E.); serpentaria, bruised (in moderately fine powder, E.), ℥iij. (℥vj. L. E.); saffron (chopped, E.), ℥i. (℥ij., L. E.); cochineal, powdered (bruised, E.), ℈ij. (℥i., L. E.); proof spirit, *by measure* ʒxx. (Oij., L. E.); "macerate for 14 days and filter," D. L. "Macerate for 7 days, strain, and express strongly, filter the liquors. It may be also conveniently prepared by percolation as directed for compound tincture of cardamom," E.). This is a more agreeable but less powerful tonic than the simple tincture. It is commonly known as *Huxham's tincture of bark*; Dose, f℥j. to f℥ss.—*Liquor Cinchonæ* (prepared by exhausting any quantity of powdered yellow bark in a percolator first with proof spirit, and then with boiling water, mixing the liquors, and concentrating in vacuo or with a gentle heat). An excellent and active preparation; Dose, min. xx. to f℥ss.—*Extractum Cinchonæ*, D. L. E. ("Pale (Yellow, Pale or Red, L.) cinchona bark, in coarse powder (bruised, L.), lb̄j. (℥xv., L.; water (distilled, L.), *by measure* lb̄vj. (cong. iv., L.); boil for 15 minutes in a vessel nearly closed (boil down in cong. j. of water to Ovj., L.), and strain the liquor while hot. In the same manner, boil down the bark in an equal measure of water, 3 (4, L.) times; lastly, all the liquors being mixed, evaporate to a proper consistence," D. L. [This extract should be kept in two states, *soft* for making pills, and *hard* that it may be reducible to powder, D.].—"Take of any variety of cinchona, but especially the yellow or red cinchona, in fine powder, ℥iv.; proof spirit, f℥xxiv.; percolate the cinchona with the spirit; distil off the greater part of the spirit, and evaporate what remains in an open vessel over the vapour bath to a due consistence," E.). The Edinburgh preparation, in which spirit is used as the solvent, is much the most active, but since the introduction of the preparations of quina into medicine, the extracts are seldom used; Dose, gr. v. to gr. xx.

*Quina* and *Cinchonia* are but seldom employed in the uncombined state, in consequence of their insolubility; nevertheless they are preferred by some continental practitioners to any of their salts. The dose of either is from gr. iij to gr. v. frequently repeated. *Quininæ sulphas*, D. *Quinæ disulphas*, L. *Quinæ sulphas*, E. Dose, gr. i. to gr. v., three or four times a day. As an antiperiodic, it is administered in ague during the intermission, in divided doses, so regulated that from gr. xv. to ℈ij., according to circumstances, may be taken in all. It may be administered in the form of pill, made with conserve of roses or mucilage, or dissolved in some aqueous vehicle with the aid of dilute sulphuric acid; it should not be prescribed, as is frequently done, in the infusion of roses, as most of it is precipitated in the form of an insoluble *tannate* of quina by the tannic acid contained in that preparation. Disulphate of quina may be administered in the form of enema, where there is very great irritability of the stomach; three times the ordinary dose or even more, may be mixed with an ordinary starch enema, and administered about an hour before the paroxysm. Or it may be introduced into the system by the en-

dermic method, the ordinary dose being sprinkled over the surface of the skin, denuded of the epidermis by means of a blister. In intermittent head-ache, gr. j. of the disulphate, mixed with gr. iij. of starch, has been snuffed up the nostrils occasionally.—*Pilulæ Quinæ*, U. S. (Sulphate of quina, ℥i.; gum acacia, in powder, ℥ij.; syrup, q. s.; mix the sulphate of quina and the gum, and beat them with the syrup so as to form a mass to be divided into 480 pills); each pill contains gr. j. of the disulphate of quina.—*Vinum Quinæ*, COLLIER, (Disulphate of quina, gr. xxiv.; citric acid, in crystals, gr. xv.; rub together, and dissolve in orange wine, f℥xxiv.). An elegant formula; Dose, f℥ss. to f℥ij.—QUINÆ MURIAS, (Prepared by decomposing an aqueous solution of the disulphate by means of an aqueous solution of chloride of barium; filtering to separate the sulphate of baryta, evaporating and crystallizing). The muriate of quina is preferred by many practitioners to the disulphate, but is much more expensive; the dose is the same.—*Acetate, Citrate, Tartrate, Nitrate, Phosphate, and Tannate of Quina*, have been also used in medicine; they are all expensive preparations, and do not appear to me to be superior in any respect to the disulphate. They may be readily prepared by dissolving pure quina or *amorphous quina* to saturation, in the respective acids previously diluted with water, evaporating and crystallizing; their doses are the same as those of the disulphate.—*Amorphous* quina is administered in the same doses as the disulphate; it may be given dissolved in water by means of a few drops of any dilute acid.

The *Arseniate of Quina* has been recently employed in France with much success in the treatment of intermittent fevers. It is prepared by boiling for a short time in a glass flask, a mixture of ℥iiiss. of pure quina, ℥i. of arsenic acid, and f℥iv. of distilled water, allowing the crystals to be deposited by cooling, separating them by filtration, and purifying by re-crystallization in distilled water. When well prepared, it is in the form of minute, feathery, white crystals; it is a bibasic salt. It is soluble in boiling water, from which the greater portion is deposited as the solution cools; it is slightly soluble in proof spirit, but very sparingly so in alcohol, and is insoluble in ether. The dose of it is from a tenth to a fourth of a grain dissolved in a large quantity of water. The *Valerianate of quina* has been also lately used on the Continent as an *antiperiodic*, and from the reports which have been published of its effects, it appears to be a valuable remedy in obstinate intermittent affections. Wittstein's process for its preparation is as follows:—Dissolve 1 part of valerianic acid in 60 parts of water, and add 3 parts of recently precipitated quina; boil the mixture, and filter it while hot. Set it aside to cool and at the end of some days, crystals of the valerianate of quina will be deposited, which are to be carefully dried at a temperature not exceeding 122°F. It crystallizes in the form of satiny rhomboidal plates, grouped in masses. It has a bitter taste, and a feeble odour of valerian; it is unalterable in the air. Valerianate of quina is a bibasic salt; it is soluble in 110 parts of cold and 40 parts of boiling water; it is more soluble in alcohol and in ether, and is also soluble in the fixed oils. The dose of it, is gr. j. three times a day in the form of pill; it has been also employed, as an external application in the form of embrocation, for which purpose one part is dissolved in sixty parts of olive oil.

The salts of cinchonia are prepared in a similar manner to those of quina; their doses are the same.

INCOMPATIBLES.—*With the preparations of Cinchona bark.*—Ammonia; lime water; carbonate of potash; arsenite of potash; tartar emetic; the sesqui-salts of iron; the acetates of lead; corrosive sublimate; nitrate of silver; tincture of galls; and gelatin. *With disulphate of quina.*—The alkalies, and their carbonates; lime water; tartaric acid; the soluble tartrates; and all vegetable tinctures, infusions and decoctions containing tannin.

CNICUS BENEDICTUS, FOLIA, D.—*Blessed-thistle. Leaves of Cnicus benedictus.* A native of the South of Europe; belonging to the Natural family *Compositæ (Asteraceæ,* Lindley), and to the Linnæan class and order *Syngenesia Æqualis.*

Although at one time highly esteemed as a tonic, the blessed thistle is so little used in the present day as scarcely to merit a place in the Materia Medica. An infusion or decoction made with ʒi. or ʒij. of the leaves, and Oj. of boiling water, was given in doses of fʒiss. to fʒiij.; principally in the treatment of scrofulous affections.

COCHLEARIA OFFICINALIS, HERBA, D.—*Scurvy-grass; Herb of Cochlearia officinalis.* Indigenous; belonging to the Natural family *Cruciferæ (Brassicaceæ,* Lindley), and to the Linnæan class and order *Tetradynamia Siliculosa.*

This plant was formerly esteemed as a tonic and antiscorbutic, but at present is only used as a domestic remedy, eaten fresh as a salad, in which state, in addition to its tonic properties, it is also slightly diuretic. It is perfectly inert when dried.

CONTRAJERVA, L.—*Contrayerva. Root of Dorstenia Contrayerva.* A native of South America; belonging to the Natural family *Urticaceæ (Moraceæ,* Lindley), and to the Linnæan class and order *Monœcia Tetrandria.*

The contrayerva root of the shops is imported from Brazil, and is obtained from the *Dorstenia Braziliensis.* It is of a reddish colour, tapering, from 2 to 3 inches long, and about the thickness of the little finger, covered with slender root fibres. It has a weak aromatic odour, and a warm bitter taste. Contrayerva root is a mild aromatic tonic at one time used in fevers of a low character, but at present it is very rarely employed. The dose of the powder is from ϑi. to ϑij.

CUPRUM AMMONIATUM, D. E. CUPRI AMMONIO-SULPHAS, L. *Ammoniated Copper. Ammonio-sulphate of Copper.*

PREPARATION.—*Dub.—Lond.—Edin.*—"Sulphate of copper, 2 parts (ʒi.,

L. E.); carbonate (sesquicarbonate, L.) of ammonia, 3 parts (℥iss., L. E.); triturate them together (in an earthenware mortar, D.) till the effervescence has entirely ceased; wrap the mass in bibulous paper, and dry it in the air. (It should be kept in well stoppered bottles, D.)"

Physical Properties.—As usually met with, this preparation is of a fine azure-blue colour, with an ammoniacal odour, and a styptic metallic taste. It is in the form of powder, but may be crystallized in large right rhombic prisms.

Chemical Properties.—The exact composition of this salt, as prepared for use in medicine, is doubtful. Exposed to the air, ammonia is given off, and a green powder left. It is soluble in water, and the solution has an alkaline reaction.

Therapeutical Effects.—Ammoniacal sulphate of copper is employed in medicine as a tonic, and in consequence of its powers as such, as an antispasmodic also. It has been principally used in the treatment of epilepsy, chorea, and other spasmodic affections, and is frequently productive of great benefit, when these diseases occur in debilitated constitutions about the period of puberty, and are unassociated with organic disease. It is not, however, as much used in the present as it formerly was.

Dose and Mode of Administration.—Gr. ss. gradually increased to gr. v. twice or three times daily; it may be given in the form of pill made with bread crumb or conserve of roses.—*Pilulæ Cupri Ammoniati*, E. (Ammoniated copper, in fine powder, 1 part; bread crumb, 6 parts; solution of carbonate of ammonia, q. s.; beat into a proper pill mass, and divide it into pills each containing gr. ss. of ammoniated copper).—*Cupri Ammoniati Aqua*, D. E.—*Liquor Cupri Ammonio-Sulphatis*, L. (Ammoniated copper, 1 part (3i., L. E.); distilled water, 100 parts (Oj., L. E.); dissolve the salt in the water, and filter). This solution is not employed in medicine, it was introduced into the pharmacopœias with the intention of being used as a test for arsenious acid, (see page 120).

Incompatibles.—Acids; potash; soda; and lime water.

In poisoning with this salt, the treatment is the same as in poisoning with sulphate of copper, (see page 45).

Cupri sulphas.—*Sulphate of Copper* (described in the division *Astringents*), has been employed as a tonic in chorea and epilepsy, but the ammoniacal sulphate is more generally preferred in these diseases. The dose and mode of administration have been described in the division *Astringents*, (see page 45).

Cusparia, L. E. Angustura, D.—*Cusparia or Angostura bark. Bark of Galipea officinalis*, E.—*of Galipea cusparia*, L.—*of Bonplandia trifoliata*, D. The bark is probably obtained from both species of *Galipea* mentioned above. They are natives of the warmer regions of South America, and belong to the Natural family *Rutaceæ*, and to the Linnæan class and order *Diandria Monogynia*.

Botanical Characters.—*Galipea officinalis* attains a height only of from 12-15 feet; Leaves, trifoliate, from 8-12 inches long, having the odour of tobacco; Flowers, white, hairy, in stalked, axillary, terminal racemes.—*Galipea cusparia* is a lofty tree, 60-80 feet high; Leaves, trifoliate, about 2 feet long, agreeably fragrant; Flowers, white, with fascicles of hairs seated on glandular bodies on the outside, in stalked, almost terminal racemes.

Physical Properties.—Cusparia bark occurs in pieces from 3-10 inches in length, some nearly flat, others incompletely quilled, covered externally with a grayish-yellow, soft epidermis, removed from one edge apparently with a sharp knife; internally, it is of a dark yellowish-brown colour, somewhat fibrous. It breaks with a short resinous fracture; has a peculiar rather unpleasant odour, and a warm bitter, somewhat acrid taste.

Chemical Properties.—According to the analysis of Fischer, this bark consists of 3·7 per cent of a peculiar bitter principle (which has been named *Cusparin* by Saladin, who obtained it in a crystalline state by submitting an alcoholic tincture of the bark, prepared by percolation, to spontaneous evaporation), 1·7 of bitter hard resin, 1·9 of balsamic soft resin, 0·3 of volatile oil, gum, lignin, &c. The active properties of the bark are extracted by water and alcohol; it is probable that they depend on the neutral principle *Cusparin*, and on the bitter resin.

*Adulterations.*—About the commencement of this century, the substitution of a highly poisonous bark, which was brought from the East Indies, for true angostura bark, was very common in the British Isles and in various parts of the Continent; but since then, so far as I am aware, it had not been met with until some years since, when a specimen of the false bark was sent to me from a druggist's in this city, labelled *Augustura bark*. Upon inquiry, I found that a chest containing about 2 cwt of the bark had lain in their store-house for upwards of forty years, but had never been before dispensed. False angostura bark may be readily distinguished from the true bark by its physical as well as chemical properties. It is generally in more perfectly quilled pieces, always much thicker and heavier; the epidermis is much mottled with greyish spots or covered with a rusty efflorescence; the taste is intensely bitter, very permanent, and it has no odour. The best chemical test is the application of nitric acid to a transverse fracture; it produces a bright red colour with the false bark, but merely deepens the colour of the true bark. The rusty efflorescence on false angostura bark, is stained greenish-black by the same acid. This false bark was for a long time referred to the *Brucea antidysenterica* a native of Africa; but the recent investigations of Christison, O'Shaughnessy and others, have proved that it is the bark of *Strychnos nux-vomica*, (see page 355).

Therapeutical Effects.—Angostura bark is an excellent tonic, devoid of all astringency. It bears much resemblance to cinchona bark, than which it is generally held in much higher estimation as a febrifuge in South America,—being adapted for the worst and most malignant bilious fevers of the marshy district, while the fevers in which cinchona bark is employed there, are simple intermittents, for the most part unattended with danger. It has never come into general use in Europe, in consequence of the serious accidents which resulted from the fraud

above noticed; nevertheless, it will be found very serviceable in atonic dyspepsia, in convalescence from acute diseases, and in the advanced stages of diarrhœa and dysentery.

Dose and Mode of Administration.—In powder, gr. x. to ʒss.—*Infusum Cusparіæ*, L. E.—*Infusum Angusturæ*, D. (Angostura bark, bruised, ʒij. (ʒv., L. E.); boiling water (distilled, L.), ℔ss. (Oj., L. E.); macerate for two hours in a covered vessel and strain, "through linen or calico," E.). Dose, fʒj. to fʒij.—*Tinctura Cusparіæ*, E.—*Tinctura Angusturæ*, D. (Angostura bark, in moderately fine powder, ʒij. (ʒivss., E.); proof spirit, *by measure* ℔ij. (Oij., E.); "macerate for 14 days and strain," D. "Made like the tincture of cinchona and most expeditiously by the process of percolation," E.). Dose, fʒi. to fʒij.

Incompatibles.—The mineral acids; sesqui-salts of iron; nitrate of silver; and the acetates of lead.

Drymis aromatica, cortex, D.—*Winter's Bark. Bark of Drymis aromatica (Drymis Winteri).* A native of the countries bordering on the straits of Magellan. It belongs to the Natural family *Winteraceæ (Magnoliaceæ*, Lindley), and to the Linnæan class and order *Polyandria Tetragynia.*

**Botanical Characters.—A large tree, about 40 feet high; Leaves, alternate, petiolate, ovate, elongated, glaucous and whitish on the under surface; Flowers, small, white, solitary, or 3 or 4 on a common footstalk.**

Properties.—This bark is at present rather scarce as it is not much employed, in consequence of which it has been omitted from the late editions of the London and Edinburgh pharmacopœias; it occurs in rolled quills from ten inches to a foot and a half long, and from half an inch to two inches in diameter, smooth externally, of a reddish-yellow colour with red oval spots. It has an aromatic odour, and an agreeable somewhat spicy taste. Its properties depend on volatile oil and resin, it also contains some tannin.

Therapeutical Effects.—Winter's bark is an excellent aromatic tonic, superior in many respects to canella bark, which is now generally substituted for it. It is so seldom used, that there are no officinal preparations of it contained in any of the British or Continental pharmacopœias. The dose of the powder is from ϑj. to ʒi.

Fel bovinum.—*Ox-Gall. The fluid contents of the gall bladder of the ox, inspissated by heat.*

Ox-gall although at one time much employed in medicine, fell completely into disuse until within the last few years, when it has been again brought under the notice of the profession, as an excellent tonic in various forms of dyspepsia. From my own experience of its effects in numerous cases in which I employed it, I can speak most highly of its remediate powers, particularly in that morbid irritability of the stomach accompanied by vomiting soon after the meals have been taken, and which

does not depend on organic disease; it appears also to act as a gentle laxative. The following is the preparation which I have employed:—*Fel Bovinum inspissatum.* (Ox-gall, any quantity; dilute with an equal quantity of distilled water, set aside for 12 hours until the impurities subside; pour off the clear liquor, boil and strain through linen or calico. Lastly, evaporate it in a water-bath to the consistence of an extract). Thus prepared, it is odourless, but has an intensely bitter taste, leaving a somewhat sweetish impression upon the tongue and palate; the dose of it is from gr. v. to gr. x. two or three times a day.

Ferrum, L. Ferri filum et limatura, E. Ferrum, fila, scobs, et oxydi squamæ, D.—*Iron filings*, L. *Iron in the form of wire, and in the form of filings*, E. *Iron, wire, filings, and scales of the oxide*, D. Iron is said to be met with in the metallic state in Russia and America, but it is very rare; it is usually found combined with other minerals in the state of oxide, sulphuret, carbonate, &c.

Preparation.—Metallic iron is an article of the Materia Medica in the three British pharmacopœias. It is most generally obtained from the native black oxide—*magnetic iron ore*, and from the native carbonate of the protoxide—*clay iron stone*, by smelting in blast furnaces.

Properties.—Pure metallic iron is of a silver white colour, but as ordinarily met with, it is greyish-white, very brilliant, hard, and ductile; it is very malleable, particularly when heated. It has a peculiar taste, and emits an odour when rubbed. At an intense heat it fuses, but before it arrives at the point of fusion, it becomes soft, and in this state possesses the remarkable property of being *welded*. Iron is attracted by the magnet, and becomes itself magnetic by induction, but if pure, immediately loses its polarity when withdrawn from the magnet. Its sp. gr. is 7·7, and its atomic weight 27·2.

Therapeutical Effects.—Iron, like other metals, does not exert any influence on the human system while it retains the metallic state; but as it is very readily oxidated and converted into salts, this change takes place in the stomach soon after it is swallowed, and then the effects of a tonic are produced. *Iron filings* were at one time much used in medicine, but in the present day they are scarcely ever employed in regular practice; the dose of them was from gr. x. to 3ss. administered in the form of electuary or bolus made with treacle or honey.

More recently the employment of metallic iron, reduced to a state of minute division by means of hydrogen *(fer réduit*, of the French), has been employed on the Continent, its use having been first introduced by M. M. Quevenne and Miquelard. To obtain it, a certain quantity of black oxide of iron *(Æthiops martis)* is introduced into a tube of porcelain which is heated to redness, and a current of hydrogen gas is then passed over it until it is reduced; which ordinarily occurs in from seven to eight hours. The chief circumstance to be attended to during the operation, is the state of the temperature. If it be not sufficiently high, the reduction does not take place; and if it be too high the iron is re-

duced, but is agglutinated into ductile plates. For preparing it on the large scale, a metal water-pipe is employed, and the oxide is placed on numerous small shelves made of sheet iron and supported on small iron bars. When well prepared it is in the form of a fine light powder, of a bright greyish-slate colour, in very minute division, and free from any trace of sulphur. The advantages which this preparation is said to possess are, first, that it is readily acted on by the weak acids—the lactic and muriatic, which are ordinarily present in the gastric juice during digestion; and secondly, that it is free from the inky taste, which the preparations of iron possess in a degree proportioned to their solubility. The dose of it is gr. j. to gr. x.; it may be given in the form of pill or of bolus.

The general effects of the ferruginous preparations, when their use has been continued for some time, are tonic and astringent; but, when they have been given in too large doses, or their use persisted in for too long a period, they produce a state of over-excitement, characterised by a feeling of determination of blood to the head, of general fulness, and by other uneasy sensations. The morbid state of the system in which the preparations of iron are found most useful, is that which has been denominated *anæmia*, in which the blood is deficient, in respect both of its quantity, and of the relative proportion of red particles. The diseases therefore in which they have been employed, are chiefly those of debility accompanied by or dependant on *anæmia*, as in chlorosis, amenorrhœa, menorrhagia, diseases of the urinary organs, scrofulous affections, passive hemorrhages, certain diseases of the digestive organs, neuralgia, &c. They have been also used with benefit in diseases of an intermittent or remittent type, in dropsical affections, in chronic enlargements of the liver or spleen, in cancer, in the advanced stages of Bright's disease of the kidney, in valvular diseases of the heart when a tonic is indicated, in chronic cutaneous affections, &c. The employment of the ferruginous preparations is contra-indicated where there is any tendency to inflammation or active hemorrhage in the system, where there is irritability of the digestive organs, in persons of a full habit of body, and in those prone to a determination of blood to the head.

### Ferri acetas, D.—*Solution of the acetate of Iron.*

Preparation.—"Carbonate of iron, 1 part; acetic acid, 6 parts; digest for 3 days and filter."—Ferri acetatis tinctura, D. "Acetate of potash, 2 parts; sulphate of iron, 1 part; rectified spirit, 26 parts; rub the acetate of potash, and sulphate of iron together in an earthen-ware mortar, till they unite into a mass, then dry them with a medium heat, and triturate with the spirit; digest the mixture, with frequent agitation, for 7 days in a well stopped bottle; lastly, pour off the tincture from the sediment and keep it in well closed vessels."—Tinctura acetatis ferri cum alcohole, D." Sulphate of iron, and acetate of potash, of each, ℥i.; alcohol, *by measure* ℔ij.; rub the salts together in an earthen-ware mortar till they unite into a mass; then dry them with a medium heat, and when cold triturate with the alcohol. Put the mixture into a well stopped bottle, and digest for 24 hours, frequently agitating. Lastly, pour off the clear liquor from the sediment, and keep in a well closed vessel."

Properties.—A liquid of a dark blood-red colour, with an acetic odour, and a strongly acid chalybeate taste. It is a solution of peroxide of iron ($Fe^2 O^3$) in acetic acid.

Therapeutical Effects.—Acetate of iron possesses the properties of the ferruginous preparations generally; but as its composition is rather uncertain, it is scarcely ever used at present. The tinctures were introduced into the pharmacopœia on the authority of Dr. Percival, who thought most highly of their chalybeate powers. I have employed them extensively in the treatment of chlorosis and of chronic diseases of the heart, and am inclined to think most highly of their remediate powers; I have generally prescribed the alcoholic tincture.

Dose and Mode of Administration.—The dose of the acetate is from min. v. to min. xx. in some aromatic water; that of the tinctures from min. xxx. to f℥i.; Dr. Percival was in the habit of administering them in asses' milk.

### Ferri ammonio-chloridum, L.—*Ammonio-chloride of Iron.*

Preparation.—"Sesquioxide of iron, ℥iij.; hydrochloric acid, Oss.; hydrochlorate of ammonia, ℔iiss.; distilled water, Oiij.; mix the sesquioxide of iron with the hydrochloric acid in a proper vessel, and digest them in a sand-bath for two hours; afterwards add the hydrochlorate of ammonia first dissolved in the distilled water; strain and evaporate all the liquor. Lastly, rub what remains to powder."

Properties.—This preparation is commonly met with in the form of an orange-yellow semi-crystalline powder, which attracts moisture when exposed to the air. It emits a feeble odour when moistened, and has a saline metallic taste. It is readily dissolved by water and by weak spirit. According to Phillips, it is a mechanical mixture of 15 parts of sesquichloride of iron, and 85 parts of hydrochlorate of ammonia.

Therapeutical Effects.—This preparation, the *Flores martiales* of the older pharmacologists, was at one time highly esteemed as a tonic and deobstruent in scrofulous affections; but, in consequence of its liability to become decomposed by keeping, and the variable quantity of iron which it contains, it is not often prescribed in the present day.

Dose and Mode of Administration.—In the solid state, gr. v. to gr. xv.—*Tinctura Ferri Ammonio-chloridi*, L. (Ammonio-chloride of iron, ℥iv.; proof spirit, Oj.; dissolve the salt in the spirit and strain). Dose, min. xij. to min. xl.

Incompatibles.—Alkalies, and their carbonates; lime water; and all astringent vegetable preparations.

### Ferri ammonio-tartras.—*Ammonio-tartrate of Iron.*

Preparation.—"Tartaric acid, 100 drachms; sesquicarbonate of ammonia,

crystalline, 39⅓ drachms; sesqui-*(per)*-oxide of iron, 53½ drachms; muriatic acid, 180 drachms; solution of ammonia, and water, of each, q. s.; dissolve the tartaric acid in cong. j. of water, and add the sesquicarbonate of ammonia gradually. Dissolve the sesquioxide of iron in the muriatic acid by means of a gentle heat; dilute the solution with Ovj. of water, and add a sufficient quantity of solution of ammonia to precipitate the oxide. Separate this on a flannel filter, wash it with water, until the washings pass tasteless; and add it to the solution containing the bitartrate of ammonia, then apply a gentle heat, by means of a water-bath, until the whole of the sesquioxide of iron is dissolved, and a deep reddish-brown solution results. Lastly, evaporate this solution, by means of a water-bath, to dryness."—Mr. Procter, *in the American Journal of Pharmacy.*

Properties.—This preparation, (which has been recently introduced into the practice of medicine, and is not contained in any of the pharmacopœias), is met with in the form of brilliant scales, semitransparent, of a beautiful reddish-brown colour. It is odourless, and has a sweetish, slightly chalybeate taste. It is soluble in about twice its weight of water at 60°, and in a much less quantity of boiling water. It is insoluble in absolute alcohol and in ether. It is composed of 1 eq. of tartrate of per-oxide of iron, 1 of tartrate of ammonia, and 4 of water.

Therapeutical Effects.—This is an excellent preparation of iron, void of all astringency. It is peculiarly suited as a tonic for those derangements of the uterine organs in which the ferruginous salts are indicated. Its not disagreeable taste, its solubility in water, and the permanency of its composition give it an advantage over most of the other preparations of iron.

Dose and Mode of Administration.—Gr. v. to gr. viij. in the form of powder, pill, or solution; or made into a bolus with honey.

Incompatibles.—The mineral acids; and all astringent vegetable preparations.

### Ferri bromidum.—*Bromide of Iron.*

Preparation.—"Bromine; and clean iron filings, of each, equal parts; heat together under water, till the fluid becomes of a greenish colour; filter and evaporate to dryness," Magendie.

Bromide of iron is of a brick-red colour, and has a disagreeable, styptic metallic taste. It deliquesces rapidly when exposed to the air, and is very soluble in water. It has been used on the Continent, it is stated with much success, in hypertrophy of the uterus, and in glandular enlargements; more recently it has been employed as a substitute for the iodide of iron. Dose, gr. iij. to gr. viij.—*Pilulæ Ferri Bromidi*, Werneck. (Bromide of iron, ʒi.; extract of liquorice, q. s.; mix and divide into 60 pills). One or two, morning and evening. It has been also employed externally in the form of ointment, prepared by rubbing together one part of the bromide and fifteen of prepared lard.

### Ferri carbonas saccharatum, E.—*Saccharine Carbonate of Iron.*

Preparation.—"Sulphate of iron, ℥iv.; carbonate of soda, ℥v.; pure sugar, ℥ij.; water, Oiv.; dissolve the sulphate and carbonate, each in Oij. of the water; add the solutions and mix them: collect the precipitate on a cloth filter, and immediately wash it with cold water, squeeze out as much of the water as possible, and without delay, triturate the pulp which remains, with the sugar previously in fine powder. Dry the mixture at a temperature not much above 120°."

Physical Properties.—A grayish or bluish-green powder; inodorous, with a sweetish, strongly chalybeate taste.

Chemical Properties.—This preparation is composed of "carbonate of protoxide of iron in an undetermined state of combination with sugar and sesquioxide of iron," *Edinburgh Pharmacopœia.* Sugar or other saccharine matter prevents the decomposition of the carbonate of the protoxide of iron, which always takes place rapidly from the conversion of the protoxide into the sesquioxide and the escape of carbonic acid. The saccharine carbonate remains unchanged for a long time even when exposed to the air. It is insoluble in water or alcohol; but dissolves completely in muriatic acid with effervescence.

*Adulterations.*—This preparation is not liable to adulteration; that it has been properly prepared may be known by "its colour being grayish-green; and by its being easily soluble in muriatic acid, with brisk effervescence," *Edinburgh Pharmacopœia.*

Therapeutical Effects.—Carbonate of the protoxide of iron is one of the best and most active of the ferruginous salts, and the permanency of its composition in the form now described renders this preparation a valuable addition to the Materia Medica. It is peculiarly adapted for children and delicate females, when the employment of a chalybeate tonic is indicated. Carbonate of iron held in solution by an excess of carbonic acid, is the active principle of many chalybeate mineral waters.

Dose and Mode of Administration.—Gr. v. to gr. xxx. in the form of powder or made into an electuary with syrup or honey.—*Pilulæ Ferri Carbonatis,* E. (Saccharine carbonate of iron, 4 parts; red-rose conserve, 1 part; beat them into a proper mass, to be divided into five grain pills). Dose, 1 to 4 pills.—In the following preparations, the carbonate of iron, prevented from undergoing decomposition by the presence of saccharine matter, is the active ingredient:—*Mistura Ferri composita,* D. L. E. (Myrrh, powdered, ℥i. (℥ij. L. E.); carbonate of potash, gr. xxv. (℥i., L. E.); rose water, ℥viiss. (f℥xviij., L. E.); sulphate of iron, powdered, ℈j. (℈iiss., L. E.); spirit of nutmeg, ℥ss. (f℥j., L. E.); pure sugar, ℥i. (℥ij., L. E.); rub together the myrrh with the spirit of nutmeg and the carbonate of potash, and to these, while rubbing, add first the rose water with the sugar, then the sulphate of iron. Put the mixture immediately into a proper glass vessel, and stop it). This mixture, which was introduced into the pharmacopœias as a substitute for *Dr. Griffith's tonic mixture,* and by which name it is commonly known, is one of the best and most generally employed of the pharmaceutical preparations of iron. Its operation is stimulant as well

as tonic, and consequently it should not be administered in cases where there is any tendency to inflammatory action in the digestive organs; the dose is f℥j. or f℥ij. two or three times a day. As it does not keep well, it should be only prepared when wanted for use.—*Pilulæ Ferri compositæ*, D. L. (Myrrh, powdered, ℥ij.; carbonate of soda; sulphate of iron; and raw sugar (treacle, L.), of each, ℥i.; rub the myrrh with the carbonate of soda; then add the sulphate of iron (and the sugar, D.), and make into a mass with treacle [rub them again; afterwards beat the whole, in a vessel previously warmed, until incorporated, L.]). Dose, gr. x. to gr. xx. two or three times a day. These pills become so hard when kept, as to be unfit for use.

Incompatibles.—Acids, and acidulous salts; and all astringent vegetable preparations.

Ferri citras.—*Citrate of Iron.* Ferri ammonio-citras.—*Ammonio-citrate of Iron.*

Preparation.—Citrate of Iron. "Crystallized citric acid, ℥iv.; distilled water, f℥iv.; moist hydrated peroxide of iron, about ℥viij.; dissolve the acid in the water in a glass matrass with the aid of heat, and saturate the solution, while boiling, with the oxide of iron, adding rather more of the oxide than the acid will dissolve. When cold, filter the solution, and make the quantity f℥xvj. This solution spread out on glass will speedily dry, and separate itself from the glass in thin plates."—Ammonio-citrate of Iron. "Add to the solution of the citrate prepared as above, sufficient ammonia to neutralize the excess of acid, and evaporate with a gentle heat to dryness." Beral.

Physical Properties.—Both these preparations are met with in the shops, and have been recently much employed in medicine although not contained in any of the pharmacopœias. They occur in the form of semitransparent, shining scales, of a garnet-red colour, inodorous; the citrate has a styptic metallic taste, and the ammonio-citrate has a similar, but much milder taste.

Chemical Properties.—Citrate of iron is permanent in the air, it is very slightly soluble in cold water, but dissolves readily in boiling water; the solution reddens litmus paper strongly. The ammonio-citrate is a very deliquescent salt, it dissolves readily in cold or boiling water; it is neutral to test paper. In both preparations, the iron is in the state of peroxide.

Therapeutical Effects.—The citrates of iron resemble much the tartrate before described, and are adapted for the same cases. The ammonio-citrate should be preferred to the simple citrate in consequence of its greater solubility.

Dose and Mode of Administration.—Gr. v. to gr. viij.; the ammonio-citrate should be always given in solution. By combining together 4 parts of citrate of iron, and 1 of citrate of quina, a preparation is obtained, which has been named *Ferri et Quinæ Citras;* it may be given in doses of from gr. iij. to gr. vj. in the form of pill, in cases where a combination of these tonics is indicated.—*Aqua Chalybeata;* Under this name, a solution of citrate of iron in water charged with car-

bonic acid and flavoured with bitter orange peel, has been introduced to the notice of the profession by Messrs. Bewley and Evans of this city. The exact formula for its preparation has not been made public; every f℥vj. hold in solution gr. xiij. of citrate of iron, it may be therefore given in doses of f℥i. to f℥ij. two or three times a day. It is the most agreeable form perhaps in which a ferruginous preparation can be administered, the only objection to its use being, that it is apt to cause unpleasant eructations shortly after it has been taken; this may be, however, to a great extent prevented, by its not being drank until the effervescence has nearly ceased. It is very generally employed, being found an efficacious preparation of iron.—*Tinctura Ferri Aurantiacea*, Wirtemberg. (Iron filings, ℥iv.; Seville oranges, 4. Remove the peel, the white, and the seeds; beat the pulp with the filings in a stone mortar, and let the paste remain at rest for two days; then pour upon it, Madeira wine, f℥x. and tincture of orange peel, f℥ij.; digest for 7 days, express, and filter). A very agreeable preparation; Dose, f℥j. to f℥iv.

Incompatibles.—The mineral acids; and all astringent vegetable preparations.

Ferri cyanuretum, *anglicé* Prussian Blue, D. Ferri percyanidum, L.—*Percyanide of Iron. Prussian Blue.*

This substance was introduced into the Materia Medica of the Dublin and London pharmacopœias solely as being employed for preparing bicyanide of mercury. It has, however, been employed in America in the treatment of intermittent and remittent fevers, and in dysentery; for which it is stated to have proved a very effectual remedy. It has been also employed in Germany with success in some cases of old standing epilepsy. But according to more recent observations, it appears to possess very little, if any therapeutical powers. The dose in which it has been administered is from gr. iij. to gr. vj. three or four times a day.

Ferri iodidum, L. E.—*Iodide of Iron. Proto-iodide of Iron.*

Preparation.—*Lond.*—"Iodine, ℥vj.; iron filings, ℥ij.; distilled water, Oivss.; mix the iodine with Oiv. of the water, and to these add the iron. Heat them in a sand-bath, and when it has acquired a greenish colour, pour off the liquor. Wash what remains with the half pint of water, boiling. Let the mixed and strained liquors evaporate at a heat not exceeding 212° in an iron vessel, that the salt may be dried. Keep in a well-stopped vessel, access of light being prevented." *Edin.*—"Take any convenient quantity of iodine, iron-wire, and distilled water, in the proportions for making syrup of iodide of iron, *(see below)*. Proceed as directed for that process; but before filtering the solution, concentrate it to one-sixth of its volume, without removing the excess of iron-wire. Put the filtered liquor quickly into an evaporating basin, with twelve times its weight of quick-lime around the basin, in some convenient apparatus in which it may be shut up accurately in a small space not communicating with the general atmosphere. Heat the whole apparatus in a hot-air press or otherwise, until the water be entirely evaporated; and preserve the dry iodide in small well-closed bottles."—Ferri iodidi syrupus, E. "Iodine (dry), 200 grains; fine iron-wire, recently cleaned, 100 grains; white sugar, in powder, ℥ivss.; distilled water, f℥vj.; boil the iodine, iron, and water together

in a glass matrass, at first gently to avoid the expulsion of iodine-vapour, afterwards briskly till about f℥ij. remain. Filter this quickly, while hot, into a matrass containing the sugar; dissolve the sugar with a gentle heat, and add distilled water to make up f℥vj.—Twelve minims contain one grain of iodide of iron."—The following simple process for preparing iodide of iron has been recently proposed by M. Cop:—Bruise together in a large mortar, 4 parts of iodine and 2 parts of water; then add quickly 1 part of iron filings. Sufficient heat is produced to drive of 1 part of iodine in the state of vapour, the mixture becomes liquid; to remove the excess of iron it is to be dissolved in water and filtered. The filtered liquor is a solution of the iodide of iron free from oxide or per-oxide. This solution may be readily preserved, by adding a sufficiency of pure sugar to it, to convert it into a syrup.

Physical Properties.—Generally met with in small crystalline masses, of an iron-grey colour, opaque, and having a metallic lustre. It has a very styptic metallic taste.

Chemical Properties.—Iodide of iron is composed of 1 eq. of iodine and 1 of iron (Fe I.), combined in the crystalline state with 5 eq. of water. It is very deliquescent, and attracting oxygen from the air is converted into a mixture of peroxide and periodide of iron; it dissolves readily in water and alcohol, but the solution when left exposed to the air is rapidly decomposed, and peroxide of iron deposited; which change is, however, prevented, if a sufficient quantity of sugar be present. Exposed to heat it fuses, and at a temperature above 350° F. it is decomposed, the iodine being volatilized and the iron left in the state of peroxide.

*Adulterations.*—That iodide of iron has been well prepared and properly preserved, may be readily known by its being entirely soluble in distilled water.

Therapeutical Effects.—Iodide of iron was first employed in the practice of medicine by Dr. A. T. Thomson of London. In its operation on the system it is more nearly allied to the preparations of iron than to those of iodine, but to a certain extent it possesses the combined properties of both. Thus, as a tonic it has been found especially useful in scrofulous debility, and under its use strumous enlargements of the glandular system have been dissipated. It has been also administered with much benefit in chlorosis and amenorrhœa when the ferruginous preparations are indicated, and it is probably one of the most useful remedies that can be employed in the treatment of secondary syphilitic affections, occurring in scrofulous or debilitated habits. In large doses iodide of iron sometimes purges.

Dose and Mode of Administration.—The dose of iodide of iron is gr. ij. to gr. v. gradually increased. It is so deliquescent a substance and the solution of it decomposes so rapidly, that many methods have been proposed for preserving it unchanged in the form of solution; of these the only two that deserve notice are, keeping in the bottle in which it is contained a piece of iron wire as first proposed by Mr. Squire of London, or forming it into a strong syrup as recommended by Dr. A. T. Thomson. The former method has been found very effectual, but it entails the necessity of filtering the solution every time it is to be used; while in the latter it is not only preserved for a length of time unaltered, but it is also an elegant form for the administration of the medicine. The syrup of the Edinburgh pharmacopœia may be given in doses of from

min. xv. to min. lx. simply dissolved in water, to which, however, it should not be added until just before it is swallowed. Owing to its great tendency to become deliquescent, and consequently to undergo decomposition, it is difficult to prescribe iodide of iron in the solid state. The best form for doing so, which has been hitherto published, is the following, communicated by Mr. Leslie of Glasgow to Professor Christison :—*Pilulæ Iodidi Ferri.* (Take of iodine 127 grains; iron wire about the thickness of a thin quill, ℥ss.; distilled water, min. lxxv. Agitate them briskly together in a strong ounce phial, provided with a well fitted glass stopper, until the froth which forms becomes white, which will happen in less than ten minutes. Pour the liquid upon ℥ij. of finely powdered loaf sugar in a small mortar, and triturate immediately and briskly for a few minutes; add gradually a mixture of the following powders, viz., liquorice powder, ℥ss.; powder of gum-arabic, ℥iss.; and flour, ℥i.; divide the mass into 144 pills). In making this preparation, the bottle should be wrapped in a coarse towel, for fear of its bursting; and the stopper held in firmly. Each pill contains one grain of iodide of iron. I have used these pills in numerous cases within the last two years, and have found them the best form for administering this medicine.

Incompatibles.—Acids, and acidulous salts; and all substances incompatible with sulphate of iron, (see page 41).

### Ferri lactas.—*Lactate of Iron. Proto-lactate of Iron.*

Preparation.—Take any quantity of sour whey; evaporate it to a third or a fourth of its volume; decant, filter, and saturate with milk of lime. Separate the precipitated lactate of lime in a filter; treat it with solution of oxalic acid to precipitate the oxalate of lime. Add to the liquor again filtered, (which is now a solution of lactic acid), clean iron filings; boil for a short time, filter, evaporate to the consistence of a syrup and crystallize by cooling." Louradour.

Physical Properties.—It occurs in the form of small greenish-yellow acicular prisms, or in powder of a dull, pale green colour, having a feeble chalybeate, not disagreeable taste, but no odour.

Chemical Properties.—It is composed of 1 eq. of protoxide of iron and 1 of lactic acid, combined in the crystalline state with 3 of water. It is but slightly soluble in water, and during solution the iron passes to a higher state of oxidation; when pure the solution in distilled water is not affected by solution of nitrate of baryta or of oxalate of ammonia. Proto-lactate of iron has an acid reaction on vegetable colours.

Therapeutical Effects.—Lactate of iron has been administered in the same cases as the other mild preparations of this metal. It has been principally used in the treatment of chlorosis and atonic amenorrhœa, in which it has been found very successful. In consequence, however, of its high price it has been hitherto but little employed in this country.

Dose and Mode of Administration.—Gr. vj. to gr. xij. in the 24 hours. It is best given in the form of lozenge or of syrup.—*Trochisci Ferri Lactatis,* Cap. (Lactate of iron, ℥vij. gr. lxxij.; pure sugar, ℥xiss.; mucilage, q. s.; make into lozenges, each weighing gr. x). Each lozenge

contains gr. $\frac{3}{4}$ of the salt.—*Syrupus Ferri Lactatis*, Cap. (Lactate of iron, ℥i.; boiling distilled water, f℥viss.; pure sugar, ℥xiij.; make into a syrup.) Dose, f℥ij. to f℥ss.

Incompatibles.—Same as for citrate of iron.

Ferri mistura aromatica, D.—*Aromatic mixture of Iron.*

Preparation.—"Pale cinchona bark, in coarse powder, ℥i.; colomba root, sliced, ℥iij.; cloves, bruised, ℥ij.; iron filings, ℥ss.; digest for 3 days in a close vessel with frequent agitation, with sufficient peppermint water to afford ℥xij. of strained liquor; then add, compound tincture of cardamoms, ℥iij.; and tincture of orange-peel, ℥iij."

This mixture is a combination of aromatic tonics holding in solution some tannate of iron; in consequence of its black colour it is commonly known as *Heberden's ink*. Notwithstanding its being an unchemical compound, it is a most excellent tonic, in very general use in this city, in the various states of debility attended with anæmia. Dose, f℥i. to f℥ij. two or three times a day.

Ferri muriatis tinctura, E. Muriatis ferri liquor, D. Tinctura ferri sesquichloridi, L. *Tincture of the muriate of Iron. Tincture of the sesquichloride of Iron.*

Preparation.—*Dub.*—"Rust of iron, 1 part; muriatic acid; and rectified spirit, of each, 6 parts; pour the acid on the rust of iron put into a glass vessel, agitate frequently for 3 days, set aside that the dregs may subside, and pour off the clear liquor; reduce this by slow evaporation to a third, and add the spirit to it when cold." *Lond.—Edin.*—"Sesquioxide (red-oxide, E.) of iron, ℥vj.; hydrochloric (muriatic, E.) acid, Oj.; rectified spirit, Oiij.; digest the oxide in the acid for 3 days in a glass vessel, with occasional agitation; then add the spirit and filter."

Physical Properties.—This preparation is transparent, and of a reddish-brown colour, it has rather an agreeable odour of muriatic ether, and a very acid styptic taste.

Chemical Properties.—It is a solution of perchloride of iron in rectified spirit, containing also free muriatic acid, and a trace of muriatic ether. It reddens litmus paper strongly. From the observations of Mr. Phillips, when prepared according to the London formula, its sp. gr. is about 992, and f℥i. yields by decomposition nearly gr. xxx. of peroxide of iron.

Therapeutical Effects.—Tincture of muriate of iron, principally in consequence of the free muriatic acid which it contains, if taken in large doses acts as an irritant poison. In medicinal doses it is one of the most generally employed of the officinal preparations of iron, and may be used as a tonic in the cases in which they are indicated. It should be borne in mind, however, that it possesses astringent properties (on which account it is sometimes used as a topical agent to check bleeding from small vessels), and also that it is more irritant than the

other preparations of the metal. Besides its tonic powers, it possesses some specific influence over the urinary organs, in many diseases of which it is employed with benefit. Thus it is found useful in irritability of the bladder especially when occurring in females, in chronic mucous discharges from the urino-genital organs, in atonic hemorrhages from the kidneys and bladder, and in spasmodic stricture of the urethra preventing the introduction of a catheter. In the latter affection, its beneficial effects are generally ascribed to the nausea which it produces, and consequently it is administered in small but frequently repeated doses, min. x. to min. xij. every ten or 15 minutes.

Dose and Mode of Administration.—Min. x. to f℥ss. gradually increased to f℥j. or f℥ij.; is best administered in f℥i. or f℥ij. of water, or in white wine if nothing forbids the use of the latter; it may be also given in infusion of quassia.

Incompatibles.—The alkalies, and their carbonates; lime water; carbonate of lime; magnesia and its carbonate; solution of gum; and all astringent vegetable preparations.

In poisoning with this preparation, the treatment is the same as in poisoning with muriatic acid, (see page 115).

Ferri oxydum nigrum, D. E.—*Black oxide of Iron. Ferroso-ferric-oxide of Iron.*

Preparation.—*Dub.*—"Wash with water, and dry the scales of oxide of iron which are found at the smiths' anvils, then remove them from impurities by means of a magnet. Reduce to powder, and separate the finer particles in the manner directed for prepared chalk." *Edin.*—"Sulphate of iron, ℥vj.; sulphuric acid (commercial), f℥ij. f℈ij.; pure nitric acid, f℥ivss.; stronger aqua ammonia, f℥iiss.; boiling water, Oiij.; dissolve half the sulphate in half the water, and add the sulphuric acid; boil, add the nitric acid by degrees, boiling the liquid briskly after each addition for a few minutes. Dissolve the rest of the sulphate in the rest of the water, mix thoroughly the two solutions, and immediately add the ammonia in a full stream, stirring the mixture at the same time briskly. Collect the black powder on a calico filter, wash it with water till the water is scarcely precipitated by solution of nitrate of baryta, and dry it at a temperature not exceeding 180°."

Physical Properties.—This compound is met with native, when it constitutes *magnetic* iron ore. Prepared according to the Edinburgh Pharmacopœia it is a grayish black powder with a velvety smoothness; the Dublin preparation is of a richer black colour. Both are strongly magnetic.

Chemical Properties.—The oxide of the Edinburgh College is a compound of 1 eq. of the protoxide and 2 of the peroxide of iron, ($FeO, 2Fe^2O^3$); that of Dublin, 5 of the protoxide and 2 of the peroxide, (Mosander). Exposed to heat in close vessels they undergo no alteration, but when heated in the open air they absorb oxygen, and pass into the state of peroxide. They dissolve readily in muriatic acid without effervescence.

*Adulterations.*—Black oxide of iron sometimes contains metallic iron, when it does not dissolve completely in muriatic acid.

Therapeutical Effects.—This preparation of iron is not much used in the present day, but formerly under the name of *Æthiops martis*, it bore a high reputation as a chalybeate tonic.

Dose and Mode of Administration.—The dose of it is from gr. v. to gr. xx. two or three times a day, made into an electuary with honey or treacle. *Ferruginous pills*, Schneider, (Black oxide of iron, in fine powder, 15 parts; calumba, and canella, of each, in fine powder, 4 parts; cayenne pepper, 1 part; extract of chamomile, a sufficiency; make into a pill mass and divide into four grain pills). Dose, 3 to 5 daily. An excellent combination in chlorosis.

Ferri oxidum rubrum, E. Ferri sesquioxydum, L. Ferri carbonas, D.—*Peroxide of Iron (by precipitation). Sesquioxide of Iron.*

Ferri oxydum rubrum, D.—*Peroxide of Iron (prepared by decomposing the sulphate by heat); Colcothar.*

Preparation.—Ferri carbonas, D. "Sulphate of iron, 25 parts; carbonate of soda, 26 parts; water, 800 parts; dissolve the sulphate of iron in the water, then add the carbonate of soda previously dissolved in a sufficiency of water, and mix. Wash the precipitated carbonate of iron with warm water, and dry it."—Ferri sesquioxidum, L. "Sulphate of iron, ℔iv.; carbonate of soda, ℔iv. ℥ij.; boiling water, cong. vj.; dissolve the sulphate of iron and carbonate of soda separately in cong. iij. of water; then the liquors being mixed together, set them by that the powder may subside. Lastly, the supernatant liquor being poured off, wash what is precipitated with water and dry it.—Ferri oxidum rubrum, E. "Sulphate of iron, ℥iv.; carbonate of soda, ℥v., boiling water, Oss.; cold water, Oiiiss; dissolve the sulphate in the boiling water; add the cold water, and then the carbonate of soda previously dissolved in about thrice its weight of water. Collect the precipitate on a calico filter, wash it with water till the water is but little affected by solution of nitrate of baryta; and dry it in the hot-air press or over the vapour-bath."—Ferri oxydum rubrum, D. "Expose the sulphate of iron to heat until the water of crystallization shall be expelled, then roast it with a strong fire as long as it gives off acid vapours. Wash the product till the washings no longer redden litmus, and lastly dry it on bibulous paper."

Physical Properties.—As obtained by precipitation, peroxide of iron is at first of a light reddish-brown colour, but becomes dark brown when dried; prepared by decomposing the sulphate, its colour is reddish chocolate brown. Both are tasteless and odourless.

Chemical Properties.—Peroxide of iron is composed of 2 eq. of iron, and 3 of oxygen, ($Fe^2$ $O^3$). The precipitated oxide contains a trace of carbonic acid unless a heat above 140° be employed in drying it, whence it was formerly termed *carbonate* or *subcarbonate* of iron; and this nomenclature is still retained in the Dublin Pharmacopœia. It is insoluble in water, and is not readily dissolved by any acid except the muriatic, in which it dissolves freely, and if it be free from carbonic acid, without effervescence.

*Adulterations.*—If it contain any earthy impurity, as brick dust, it will not be completely soluble in muriatic acid, aided by a gentle heat.

Therapeutical Effects.—Peroxide of iron may be used as a chalybeate tonic in the same cases as the other ferruginous preparations. Its principal use, however, is in the treatment of neuralgic affections, particularly tic douloureux, as a remedy for which it was first proposed, under the old name of *Carbonate*, by Mr. Hutchinson. In many instances it will be found to give complete relief, but it frequently fails to prove of the least service. Mr. Carmichael of this city has found this preparation a useful palliative in cancerous diseases.

Dose and Mode of Administration.—The peroxide of iron is administered in doses of from 3ss. to 3iv. three or four times a day. It may be given in the form of electuary made with honey, and some aromatic powder combined with it.—*Emplastrum Thuris*, D. (Litharge plaster, ℔ij.; frankincense, ℔ss.; red oxide of iron, ℥iij.; melt the plaster and frankincense together, sprinkle in the oxide, stirring at the same time, and make a plaster).—*Emplastrum Ferri*, E. (Litharge plaster, ℥iij.; resin, 3vj.; olive oil, f3iiiss.; bees wax, 3iij.; red oxide of iron, ℥i.; triturate the oxide of iron with the oil and add the mixture to the other articles previously melted with a gentle heat; mix the whole thoroughly). These plasters are employed spread on leather to give mechanical support in muscular relaxations and weakness of the joints; by some they are believed to be tonic.

Incompatibles.—The mineral acids; and acidulous salts.

### Ferri phosphas. *Phosphate of Iron.*

Preparation.—"Take of sulphate of iron, ℥v.; phosphate of soda, ℥vi.; water, cong. j. Dissolve the sulphate of iron and phosphate of soda, separately in Oiv. of the water; then mix the solutions; and set the mixture by that the powder may subside; lastly having poured off the supernatant liquor, wash the phosphate of iron with hot water, and dry it with a gentle heat."

Properties.—Phosphate of iron is in the form of a fine bluish or greenish-white powder. It has a ferruginous taste, but no odour. According to Berzelius, it is a compound of the phosphates of the proto- and per-oxides of iron. It is insoluble in water.

Therapeutical Effects.—Phosphate of iron possesses the tonic properties of the other ferruginous preparations; it is so rarely used, however, in the present day, that it is not contained in the British or French Pharmacopœias. It appears to me to be peculiarly adapted for those scrofulous affections of children, in which there is softening of the osseous system, and for rickets. In America it is employed in amenorrhœa and in some forms of dyspepsia.

Dose and Mode of Administration.—Gr. v. to gr. x. in powder or made into pill with extract of liquorice.

Ferri sulphas.—*Sulphate of Iron* (described in the division *Astringents*), is an excellent tonic, and is employed with much benefit in the same cases as the other ferruginous compounds, provided its astringent

property does not contra-indicate its use. I have found the dried sulphate (see page 47), combined with the pill of aloes and myrrh, produce excellent effects in the treatment of chlorosis.

FERRI TARTRAS.—*Tartrate of Iron.*

The preparation often met with in the shops under this name, is the *ammonio-tartrate* described before. In former editions of the British pharmacopœias, a wine of iron, *Vinum Ferri,* was contained, and is still frequently prescribed; the best method of preparing it is as follows:—*Vinum Ferri,* SOUBEIRAN. (Tartrate of protoxide of iron, 1 part; tartaric acid, 1 part; white wine, 1000 parts. Rub the tartrate of iron and tartaric acid together in a porcelain or glass mortar; then add the white wine, and filter the solution if necessary. Tartrate of protoxide of iron is readily prepared, by decomposing an equivalent of proto-sulphate of iron with an equivalent of neutral tartrate of potash, instantly washing the precipitate with water, collecting it on a strainer, pressing it strongly and drying over a water bath). The dose of the wine is from f℥i. to f℥ss.

FERRI VALERIANAS.—*Valerianate of Iron.*

PREPARATION.—Prepare a solution of valerianic acid by the process directed in the preparation of valerianate of zinc (page 32), saturate the solution of it thus obtained with carbonate of soda; and boil the mixture until all the carbonic acid is expelled. Pour this liquid when cold on a solution of perchloride of iron, (made with 3 parts of the perchloride and 100 parts of water), as long as any precipitate is thrown down. Wash the precipitate and dry it at a temperature not exceeding 75° F.

PHYSICAL PROPERTIES.—The salt thus procured is in the form of an amorphous powder, of a brick-red colour; it has both the odour and taste of valerianic acid.

CHEMICAL PROPERTIES.—According to Wittstein's observations it is composed of 7 eq. of valerianic acid, 3 of peroxide of iron, and 2 of water; its formula being, 7 $C^{10}H^9O^3$, 3 $Fe^2$ $O^3$ + 2 HO. It is insoluble in water and alcohol; boiling water decomposes it, dissolving out the valerianic acid and leaving pure hydrated per-oxide of iron. When heated, the acid is driven off at even a low temperature.

THERAPEUTICAL EFFECTS.—Valerianate of iron has not been as yet much used in medicine. It is a powerful tonic, possessing some antispasmodic properties also. It appears to be peculiarly adapted for the treatment of chorea and other nervous affections which so frequently occur in debilitated or anemic females. It would also probably prove a useful remedy in chlorosis.

DOSE AND MODE OF ADMINISTRATION.—In consequence of its insolubility, it must be prescribed in the solid form; the dose of it is from gr. j. to gr. iij. three or four times a day made into pill with hard manna and a little mucilage.

Ferrugo, E.—*Hydrated Sesquioxide of Iron.* Ferri rubigo, D.—*Rust of Iron.*

Preparation.—Ferri rubigo, D. "Iron wire, broken into fragments, any quantity; moisten with water, and expose to the air, until they are corroded into rust. Triturate it in a mortar, and by affusion with water, wash out the finer powder, which is to be dried."—Ferrugo, E. "Sulphate of iron, ℥iv.; sulphuric acid (commercial), f℥iiiss; nitric acid, (D. 1380), f℥ix.; stronger aqua ammoniæ, f℥iiiss.; water, Oij.; dissolve the sulphate in the water, add the sulphuric acid, and boil the solution; add then the nitric acid in small portions, boiling the liquid for a minute or two after each addition, until it acquires a yellowish-brown colour and yields a precipitate of the same colour to ammonia. Filter; let the liquid cool; and add in a full stream the aqua ammonia, stirring the mixture briskly. Collect the precipitate on a calico filter, wash it with water till the washings cease to precipitate with nitrate of baryta; squeeze out the water as much as possible; and dry the precipitate at a temperature not above 180°. When this preparation is kept as an antidote for poisoning with arsenic, it is preferable to preserve it in the moist state after being simply squeezed."

A hydrated peroxide of iron may be also readily prepared by precipitating the tincture of the muriate with ammonia.

These preparations are very nearly similar in chemical composition, but as rust of iron is not used in medicine in the present day, in the following observations I shall refer to the Edinburgh preparation only.

Properties.—The hydrated sesquioxide of iron is in the form of a yellowish-brown powder, inodorous and tasteless. It is composed of 1 eq. of per- (sesqui-) oxide of iron and 2 of water ($Fe^2O^3 + 2HO$). It is insoluble in water but dissolves readily in dilute acids; heated it gives off water and a little ammonia, and the red peroxide of iron is left. If in the moist state the hydrated sesquioxide of iron in considerable excess (*at least* 12 *parts of oxide to* 1 *part of arsenic*, Dr. Maclagan) be agitated with a solution containing arsenious acid, a very insoluble compound (*arsenite of protoxide of iron*, Graham) is formed, and the filtered liquor gives no trace of arsenious acid.

Therapeutical Effects.—In its medicinal properties this preparation is precisely similar to the dry peroxide. It has been advisedly introduced into the last edition of the Edinburgh pharmacopœia, as being the most certain antidote for poisoning with arsenic which has been yet discovered. Its antidotal powers are now well established by the result of numerous cases, in which it has proved successful within the last fourteen years, both in this country and on the Continent. The quantity required to neutralize the poisonous property of arsenic, as above remarked, is at least 12 parts to 1 of the poison, but it should be always given in as large doses as the stomach will bear. Thus a table-spoonfull may be mixed with water, and this quantity administered every five or ten minutes. Hydrated peroxide of iron does not prove near so efficacious an antidote when dried, as when kept in the form of moist magma.

Ferrum tartarizatum, E. Ferri tartarum, D. Ferri potassio-tartras, L.—*Tartrate of Iron and Potash. Potassio-tartrate of Iron.*

Preparation.—*Dub.*—"Thin iron wire, 1 part; bitartrate of potash, in fine powder, 4 parts; distilled water, 8 parts or a sufficiency; mix them together, and expose to the air in an open vessel for 15 days; agitating frequently, and adding water daily so as to keep the mixture moist, but taking care not to cover the iron completely with water. Finally, boil with a sufficient quantity of distilled water, evaporate the filtered liquor to dryness in a vapour-bath, and keep the tartar of iron in well-closed vessels." *Lond.*—"Sesquioxide of iron, ℥iij.; hydrochloric acid, Oss.; solution of potash, Oivss. or a sufficiency; bitartrate of potash, ℥xiss.; solution of sesquicarbonate of ammonia, Oj. or a sufficiency; distilled water, cong. iij.; mix the sesquioxide of iron with the acid, and digest for 2 hours in a sand-bath. Add to these, two gallons of the water and set aside for an hour; then pour off the supernatant liquor. The solution of potash being added, wash what is precipitated frequently with water, and while moist boil it with the bitartrate of potash, previously mixed with a gallon of the water. If the liquor should be acid when tried by litmus, drop into it solution of sesquicarbonate of ammonia until it is saturated. Lastly, strain the liquor, and with a gentle heat let it evaporate, so that the salt may remain dry." *Edin.*—"Sulphate of iron, ℥v.; bitartrate of potash, ℥v. ℥i.; carbonate of ammonia, in fine powder, a sufficiency. Prepare rust of iron from the sulphate as directed for *Ferrugo*, and without drying it. Mix the pulpy mass with Oiv. of water; add the bitartrate; boil till the rust of iron is dissolved; let the solution cool; pour off the clear liquid, and add to this the carbonate of ammonia so long as it occasions effervescence. Concentrate the liquid over the vapour-bath to the consistence of thin extract, or till the residuum becomes on cooling a firm solid; which must be preserved in well-closed vessels."

Physical Properties.—This salt occurs in the form of a grayish-brown powder, with a greenish tint; it is inodorous, but has a somewhat styptic, not disagreeable taste.

Chemical Properties.—It is composed of 1 eq. of tartrate of potash, and 1 eq. of tartrate of sesquioxide of iron, (Phillips). It deliquesces slightly in damp air, is very soluble in water, requiring about 4 parts of cold water for its solution, and is slightly soluble in alcohol. The solution is of a greenish-yellow colour; it is not decomposed by the alkalies or alkaline carbonates, unless with the aid of heat; and it will retain its composition unchanged for a considerable time.

*Adulterations.*—As met with in the shops, tartrate of iron and potash is often imperfectly prepared, the oxide of iron not being chemically combined with the bitartrate of potash. The tests of the *Edinburgh Pharmacopœia* will detect this as well as other faults which are likely to occur in the preparation:—"Entirely soluble in cold water; taste feebly chalybeate; the solution is not altered by Aqua potassæ, and is not precipitated by solution of ferrocyanide of potassium." I have in several instances met with specimens of this salt which contained carbonate of potash; they were exceedingly deliquescent and effervesced with dilute acids.

Therapeutical Effects.—This is a mild chalybeate tonic, and may be used in all cases where the milder preparations of iron are indicated. In consequence of its taste, it is well adapted for children.

Dose and Mode of Administration.—Gr. v. to gr. xx. made into a bolus with honey or treacle, or dissolved in some aromatic water.

Incompatibles.—The mineral acids; lime water; and all astringent vegetable preparations.

GENTIANA, L. E. GENTIANA LUTEA, RADIX, D.—*Gentian. Root of Gentiana lutea.* A native of the mountainous regions of central Europe; belonging to the Natural family *Gentianaceæ*, and to the Linnæan class and order *Pentandria Digynia.*

BOTANICAL CHARACTERS.—Root, perennial; Stem, annual, simple, erect, 3-4 feet high, roundish, hollow; Leaves, opposite, broad, ovate, 5-7 nerved, plaited; Flowers, yellow, whorled, numerous, on smooth peduncles; Fruit, a conical capsule, 2-valved, many-seeded.

PHYSICAL PROPERTIES.—Gentian root is imported in bales from Switzerland by way of Havre, Marseilles, &c. It is in pieces varying in length from two or three to eight or ten inches, and from half an inch to one or two inches in thickness, usually contorted and much branched; the epidermis is wrinkled and somewhat annulated, of a brownish-yellow colour; internally the root is of a bright-yellow colour, and has a spongy texture. It has a faint aromatic odour, which in the fresh state is said to be strong and disagreeable, and an intensely bitter taste, void of all astringency.

CHEMICAL PROPERTIES.—Gentian consists of odorous volatile oil, a yellow crystallizable bitter neutral principle *(gentianin* of M. M. Henry and Caventou; but which, according to Leconte and Tromsdorf, is a compound of simple colouring matter not bitter *(gentisin)*, a bitter principle *(gentianite)*, and fatty matter,), a matter identical with bird-lime, green fixed oily matter, a free organic acid, uncrystallizable sugar, gum, yellow colouring matter, and lignin. Gentian imparts its active principles readily to cold or boiling water, alcohol, and ether.

*Adulterations.*—The roots of other species of gentian are frequently mixed with those of *Gentiana lutea*, an adulteration of little importance, as for the most part they possess analogous properties. A more serious fraud has been, however, sometimes practised, that of mixing the roots of belladonna, monkshood, or white hellebore with gentian; they may be readily detected, as they do not possess either the intense bitter taste or the bright-yellow colour internally, of gentian root. In France powdered gentian root is very commonly adulterated with *yellow ochre*, so much as 50 per cent being often mixed with it. The fraud may be detected by boiling a small quantity of a suspected specimen for a few minutes with very dilute sulphuric acid, filtering, and testing the filtered liquor with tincture of galls; if any ochre had been present, a blackish precipitate will be produced.

THERAPEUTICAL EFFECTS.—Gentian is an excellent pure bitter tonic, and is one of the most generally employed of this class of medicines. In large doses it often causes vomiting, and it has a tendency to relax the bowels. The diseases in which gentian is employed with most benefit are those forms of dyspepsia attended with torpid digestion and secretion of acid, but unaccompanied by any tendency to irritability or inflammation of the stomach. It is also a useful tonic in the debility attendant on chronic diseases; and in consequence of its bitterness it proves anthelmintic.

DOSE AND MODE OF ADMINISTRATION.—In powder, seldom used,

gr. x. to gr. xxx.; as gentian possesses little if any aroma, aromatics are usually prescribed in combination with it.—*Infusum Gentianæ compositum*, D. L. *Infusum Gentianæ*, E. ("Gentian, sliced; orange-peel, dried, of each, ʒi. (ʒij., L.); lemon-peel, fresh, ʒi. (ʒiv., L.); boiling (distilled, L.) water, ℥xij. (Oj., L.); Digest (macerate, L.) for an hour in a covered vessel, and strain," D. L.—"Gentian, sliced, ʒss.; bitter orange peel, dried and bruised, ʒj.; coriander, bruised, ʒi.; proof spirit, fʒiv.; cold water, fʒxvj.; pour the spirit on the solids; in three hours add the water; in 12 hours more strain through linen or calico," E.). The Edinburgh preparation keeps best, but the spirit it contains will in many cases render its use objectionable. The infusion of the Dublin and London Colleges soon spoils by keeping, it should therefore be prepared only when required for use. Dose, fʒi. to fʒij.; it is an excellent vehicle for the alkaline bicarbonates.—*Mistura Gentianæ composita*, L. (Compound infusion of gentian, fʒxij.; compound infusion of senna, fʒvj.; compound tincture of cardamom, fʒij.; mix). An excellent cathartic in constipation attended with debility of the digestive organs. Dose, fʒi. to fʒij.—*Tinctura Gentianæ composita*, D. L. E. ("Gentian, sliced (and bruised, D.), ℥ij. (ʒiiss., L.); orange-peel, dried, ʒi. (ʒx., L.); cardamom seeds, (without the capsules, D. bruised, L.), ʒss. (ʒv., L.); proof spirit, *by measure* ℔ij. (Oij., L.); macerate for 14 days, and strain," D. L.—"Gentian, sliced and bruised, ℥ij.; dried bitter orange-peel, bruised, ℥i.; canella, in moderately fine powder, ʒss.; cochineal, bruised, ʒss.; proof spirit, Oij.; digest for 7 days, strain and express strongly; and then filter the liquor. This tincture may be more conveniently prepared by percolation, as directed for the compound tincture of cardamom," E.). Dose, fʒi. to fʒij., generally used as an adjunct to the infusion.—*Tinctura Rhei et Gentianæ*, E. (Rhubarb, in moderately fine powder, ʒij.; gentian, finely cut or in coarse powder, ℥ss.; proof spirit, Oij.; mix the powders and proceed as directed for tincture of cinchona). Stomachic and tonic, with mild laxative properties. Dose, fʒi. to fʒij.—*Vinum Gentianæ compositum*, E. (Gentian in coarse powder, ʒss.; yellow bark, in coarse powder, ʒj.; bitter orange-peel, dried and sliced, ʒij.; canella, in coarse powder, ʒi.; proof spirit, fʒivss.; sherry, fʒxxxvj.; digest the root and bark for 24 hours in the spirit; add the wine and digest for 7 days more; strain and express the residue strongly; and filter the liquors). An excellent stomachic and tonic; Dose, fʒss. to fʒj.—*Extractum Gentianæ*, D. L. E. (Prepared, as the other *simple* extracts, as follows:—"Boil the root in eight times its weight of water down to one-half; then express the liquor and when the feces have subsided, filter; evaporate with a *superior* heat, till it begins to thicken, and finally inspissate it with a *medium* heat obtained by means of the vapour of boiling water, frequently stirring it until it acquires a consistence adapted to the formation of pills," D.—"Gentian, sliced, ℔iiss.; boiling distilled water, cong. ij.; macerate for 24 hours; then boil down to a gallon, and strain the liquor while hot; lastly, evaporate to a proper consistence," L.—"Gentian, any convenient quantity; bruise it to a moderately fine powder; mix it thoroughly with half its weight of distilled water; in 12 hours put it into a percolator, and exhaust it by percolation with temperate distilled water. Concentrate the liquid; filter it before it becomes too thick;

and evaporate in the vapour-bath to the due consistence," E.). An excellent tonic extract; Dose, gr. x. to ʒss. two or three times a day, in the form of pill; in this state it may be prescribed with the preparations of iron.

Incompatibles.—Solution of diacetate of lead; nitrate of silver; sulphate of iron; and analogous salts.

Menyanthes, L. E. Menyanthes trifoliata, folia, D.—*The common Buckbean. Leaves of Menyanthes trifoliata.* An indigenous plant, growing plentifully in marshy places; belonging to the Natural family *Gentianaceæ,* and to the Linnæan class and order *Pentandria Monogynia.*

Botanical Characters.—Roots, densely creeping and matted; Leaves, ternate, stalked; Leaflets, obovate, obscurely toothed; Flowerstalk, simple, from 5 to 8 inches high, bearing a compound raceme of many white flowers, tipped externally with red, and beautifully fringed with white filaments within.

The whole of this plant possesses a bitter taste, which it retains when dried; it contains bitter extractive, green colouring matter, albumen, starch, and a trace of tannic acid. Buckbean is a tonic of some power and may be used as an indigenous substitute for gentian. The dose of the dried leaves in powder is from gr. x. to ʒss.; or of an infusion (prepared with ʒi. of the dried leaves, and Oj. of boiling water), fʒi. to fʒij. An extract may be prepared in the same manner as extract of gentian, the dose of it would be from gr. x. to gr. xx.

Incompatibles.—The sesqui-salts of iron; nitrate of silver; and acetate of lead.

Myrrha, D. L. E.—*Myrrh. Gum resin of Balsamodendron myrrha,* L. *Gummy resinous exudation of Balsamodendron (Protium?) myrrha,* E. A native of Gison on the borders of Arabia Felix and of Southern Abyssinia; belonging to the Natural family *Amyridaceæ,* and to the Linnæan class and order *Octandria Monogynia.*

Botanical Characters.—An arborescent shrub, with a pale ash-grey bark, and spinescent branches; Leaves, ternate, on short footstalks; Flowers, unknown; Fruit, somewhat larger than a pea, ovate, acuminate, brown.

Preparation.—Myrrh exudes from the tree like cherry-tree gum, issuing from natural fissures in the bark and from bruises made with stones; it is at first of the consistence of oil, but soon becomes hard and darker-coloured. It is imported into Britain by way of the East Indies.

Physical Properties.—Myrrh, like the other gums, is met with in commerce of different qualities. The finest, *Turkey Myrrh,* (so called because it was formerly imported by way of Turkey,) is in irregular-shaped tears or masses, varying in size from that of a pea to that of a chesnut, but pieces are often met with more than twice that size; they are semi-transparent, of a reddish-yellow or reddish-brown colour, the larger pieces being the darker coloured; their fracture is shining, somewhat fatty, pre-

senting often small white striæ in the centre, particularly of the largest masses. The taste of myrrh is acrid and bitter, the odour agreeable and aromatic; the finer pieces of Turkey myrrh are often selected and sold as picked myrrh. The inferior sorts, *East India myrrh*, are on an average in much smaller tears than Turkey myrrh; some of the tears are almost transparent and of a very pale colour, others are dark brown; they are generally mixed with other gums.

Chemical Properties.—Myrrh has been recently carefully analysed by Ruickoldt. Its specific gravity varies from 1·120 to 1·180. It is composed of 2·183 per cent of volatile oil *(Myrrhol)*, 44·760 of resin *(Myrrhin)*, 40·818 of gum *(Arabin)*, carbonates of lime and magnesia, and a trace of gypsum and oxide of iron. Its medicinal properties depend on the volatile oil and resin, both of which are dissolved out completely by rectified spirit, partially by proof spirit, and very slightly by water; the latter menstruum dissolves all the soluble gum, and forms with it a thicker mucilage than with gum-acacia. By heat myrrh is softened, but does not melt; it is inflammable.

*Adulterations.*—Myrrh is frequently adulterated with the inferior sorts, and with other gum-resins. The finer pieces of Turkey myrrh should alone be employed in medicine. Righini has proposed the following method for ascertaining the purity of myrrh:—Reduce to very fine powder 4 parts each of myrrh and the muriate of ammonia, and triturate them together for about a quarter of an hour; then add gradually and with constant agitation, from 60 to 100 parts of water. If the myrrh be pure and does not contain any foreign bodies, the mixture dissolves readily.

Therapeutical Effects.—Myrrh is a stimulating tonic, and is consequently inadmissible in cases where there is any tendency to inflammatory action. It is principally used in debilitated states of the digestive organs, or in diseases attended with excessive secretion from the mucous membranes. It is an excellent addition to alteratives and astringents in the protracted diarrhœas of infancy and childhood. Myrrh was formerly in high esteem as an emmenagogue, but it has completely lost its repute as such.

Dose and Mode of Administration.—Gr. x. to gr. xxx. in powder or made into an emulsion with water.—*Tinctura Myrrhæ*, D. L. E. (Myrrh, bruised (in moderately fine powder, E.), ℥iij. (℥iiiss., E.); rectified spirit, *by measure* ℔ss. (Oij., L. E.); (proof spirit, *by measure* ℔iss., D.); "Digest (macerate L.) for 7 (14 L.) days, and filter," D. L.; "Pack the myrrh very gently without pressure in a percolator; then pour on the spirit; and when two pints have passed through, agitate well to dissolve the oleo-resinous matter which first passes, and which lies at the bottom. This tincture is much less conveniently prepared by the process of digestion for 7 days," E.). The dose of this tincture for internal use is from f℥i to f℥ij. It is most generally employed diluted with water as a lotion in sponginess or ulceration of the gums; it is also used as a stimulant application to foul ulcers. When mixed with water, in consequence of the precipitation of the resin, a milky solution is formed.

Quassia, L. E. Quassia excelsa, lignum. D.—*Quassia. The wood of Quassia excelsa,* D. L.—*chiefly of Picræna excelsa, and seldom of Quassia amara,* E.—The *Quassia* or *Picræna excelsa* is a native of Jamaica; belonging to the Natural family *Simarubaceæ,* and to the Linnæan class and order *Decandria Monogynia.* The *Quassia amara* or true quassia tree yields none of the quassia at present met with in British commerce; it is a native of the Continent of South America and of many of the West Indian islands.

Botanical Characters.—*Picræna excelsa* is a tall handsome tree often attaining a height of 100 feet; Leaves, pinnated; Flowers, small, yellowish-green, in axillary, very compound racemes.

Physical Properties.—Quassia wood is imported in billets from two to nine inches in diameter, covered with a brittle, reticulated, dark-brown bark. The wood is close, but light, of a pale yellow colour, odourless, with an intensely bitter taste. The billets are cut into chips for medical use.

Chemical Properties.—It is composed of lignin, gummy matter, some salts of lime, a minute trace of volatile oil, and a peculiar, neutral bitter principle which has been named *quassin* or *quassite.* It yields its bitterness to boiling water and to alcohol.

*Adulterations.*—Quassia wood being scarce, other woods which resemble it in appearance are frequently substituted for it. They may be at once detected by their wanting the pure bitter taste of quassia; the infusion also of most of the spurious quassias is coloured blackish by the sesqui-salts of iron, but no effect is produced with the infusion of the true wood.

Therapeutical Effects.—Quassia is amongst the most powerful of the pure bitters, and consequently is essentially tonic; according to some it possesses narcotic properties also, and it undoubtedly acts as a narcotic poison on insects and some of the lower animals. In medicine it is chiefly used in dyspepsia resulting from atony of the digestive organs, and is found particularly useful in that form of it which is produced by dissipation. The infusion forms an excellent vehicle for alkaline remedies in the acidity of the stomach of gouty and rheumatic habits, and for the saline purgatives in the constipation of atonic dyspepsia. Owing to its intense bitterness, quassia is no mean anthelmintic.

Dose and Mode of Administration.—In consequence of the difficulty of reducing it to powder, quassia is not given in substance, the dose of it would be from gr. xv. to gr. xxx.—*Infusum Quassiæ,* D. L. E. (Quassia sliced, ℈j. (℈ij. L. ℈iij., E.); boiling (distilled, L.) water, *by measure* ℔ss. (Oj., L. E.); infuse for two hours in a covered vessel, and strain). Dose f℥i. to f℥ij.; if given in too large doses it is apt to occasion vomiting. The chalybeate preparations do not alter the colour of infusion of quassia, it may therefore be employed as a vehicle for their administration—*Tinctura Quassiæ,* D. E. (Quassia chips, ℥i. (3x. E.); proof spirit, *by measure* ℔ij. (Oij. E.); macerate for 7 days and strain). Dose, f℥i. to f℥ij.—*Tinctura Quassiæ composita,* E. (Cardamom seeds, bruised; and cochineal, bruised, of each ℥ss.; cinnamon, in mo-

derately fine powder; and quassia chips, of each, ʒvj.; raisins, ʒvij.; proof spirit, Oij.; digest for 7 days, strain the liquor, express strongly the residuum, and filter. This tincture may be also made by percolation, as directed for compound tincture of cardamom, provided the quassia be rasped or in powder). An aromatic and bitter tonic; Dose, fʒi. to fʒss. —*Extractum Quassiæ*, E. (To be prepared from quassia in the same way with extract of liquorice root). Dose gr. v. to gr. xv. in pill.

Incompatibles.—*With the infusion.* Nitrate of silver; and the acetates of lead.

Salix, E. Salix caprea, cortex; Salix fragilis, cortex; Salix alba, cortex, D.—*Willow-bark. Bark of Salix caprea*, E.,—*and of Salix fragilis and Salix alba*, D. The genus salix is placed in the Natural family *Salicaceæ*, and in the Linnæan class and order *Diœcia Diandria*. There are no less than 64 species of Salix indigenous to the British islands; any of the species which possess a bitter tasting bark may be used in medicine.

Botanical Characters.—Shrubs or trees. *Barren flowers;* Scales of the catkin, single flowered, imbricated, with a nectariferous gland; Perianth, none; Stamens, 1-5. *Fertile flowers;* Scales of the catkin, single-flowered, imbricated, with a nectariferous gland; Perianth, none; Stigmas, 2, often cleft; Capsule, 1-celled, 2-valved, many-seeded; Seeds, comose. Hooker.

Physical Properties.—Dried willow-bark is met with in partially quilled pieces of from 6 to 8 inches in length; the epidermis is smooth and of a silver-gray colour. It is odourless, but has a very bitter, somewhat astringent taste.

Chemical Properties.—Willow-bark yields its properties to boiling water and to alcohol. Its constituents are tannin, resinous extractive, gummy matter, chlorophylle, yellowish colouring matter, an organic salt of magnesia, and a peculiar principle named *Salicin*, on which the febrifuge and tonic properties of the bark depend. The best process for preparing *Salicin* is that of Erdmann; it is as follows:—"Take the bark of Salix pentandra (or of any other of the species, the bark of which tastes bitter), ℔j.; macerate for 24 hours in milk of lime consisting of ʒij. of recently burned lime in Oviij. of water; then boil for half an hour. Pour off the liquor and repeat the process twice with the residuum. Mix all the decoctions; allow the mixture to settle, and pour off the clear liquor, concentrate to Oij.; digest with ʒviij. of animal charcoal, filter and evaporate to dryness. Exhaust with spirit containing 28 per cent of alcohol, distil off the spirit, and purify the crystals which form, by boiling with animal charcoal and recrystallizing. Thus treated, ℔j. of bark yields ʒv. of salicin." Salicin crystallizes in delicate, colourless, silky needles, which have an intensely bitter taste, but no odour; they are neutral. It is permanent in the air, is not altered at a temperature of 212°, fuses at 248°, and is decomposed at a higher temperature. It is soluble in 18 parts of cold, and in 1 of boiling water; is very soluble in alcohol, but insoluble in ether and oil of turpentine. Its composition is $C^{26}H^{18}O^{14}$, (Piria). The presence of salicin in large quantity in

willow-bark is indicated by sulphuric acid reddening a strong decoction.

Therapeutical Effects.—Willow-bark is an excellent tonic and has been used successfully as a febrifuge. It may be employed in the same cases as cinchona bark for which it forms an admirable indigenous substitute. Salicin resembles in its properties disulphate of quina, over which it possesses the advantage of not being so liable to irritate the stomach. I have used it very extensively as a tonic in the debility following acute diseases, particularly in cases accompanied by irritability of the digestive organs, and consider its powers to be fully equal to those of disulphate of quina.

Dose and Mode of Administration.—Of the powdered bark, ʒss. to ʒj.—*Salicin.* As a tonic, gr. ij. three or four times a day; as a febrifuge, ϑi. to ϑij. in divided doses during the intermission. It may be given in powder combined with sugar or some aromatic powder; or dissolved in water sweetened with some agreeable syrup, as syrup of orange-peel, or syrup of *Hemidesmus Indicus.*

Incompatibles.—Ammonia and its carbonates; lime water; carbonate of potash; the sesquisalts of iron; acetate of lead; corrosive sublimate; and sulphate of zinc.

Simaruba, L. E. Quassia simaruba, cortex radicis, D.—*Simaruba. Bark of the root of Simaruba amara,* E.— *of Simaruba officinalis,* L.—*of Quassia simaruba,* D. The same tree is indicated by the three Colleges, but the nomenclature of different botanists has been adopted. It is a native of Jamaica and Guaiana, and belongs to the Natural family *Simarubaceæ,* and to the Linnæan class and order *Decandria Monogynia.*

Botanical Characters.—A tall tree, with long creeping roots; Leaves, alternate, pinnate; Flowers, small, whitish, dicœcious, in panicles; Fruit, 5 ovate smooth black capsules, placed on a fleshy disk.

Physical Properties.—The bark of the root is alone officinal, it is imported from Jamaica, and is in long pieces folded flat, covered with a reddish-yellow epidermis, wrinkled and warty; the inner surface of the bark is yellowish-brown. It has a bitter, persistent taste, but no odour.

Chemical Properties.—Simaruba bark contains a trace of volatile oil, resinous matter, *ulmin*—a bitter principle analogous to *quassin,* lignin and some salts. It yields its properties readily to water and to alcohol.

Therapeutical Effects.—Simaruba is a bitter tonic, not much prescribed in the present day; in large doses it produces vomiting and purging. It has been highly praised for its remediate powers in chronic diarrhœa and dysentery, by many practitioners both on the Continent and in this country. As a bitter tonic it is, however, much inferior to many remedies of this class.

Dose and Mode of Administration.—It is not given in powder; the following is its only officinal preparation.—*Infusum Simarubæ,* D.

L. E. (Simaruba, bruised, ʒss. (ʒiij., L. E.); boiling (distilled, L.) water, *by measure* ℔ss. (Oj., L. E.); infuse for two hours in a covered vessel, and strain "through linen or calico," E.) Dose, fʒi. to fʒij.

Incompatibles.—Lime water; alkaline carbonates; the salts of lead, mercury, and silver; and astringent vegetable infusions or decoctions.

Taraxacum, L. E. Leontodon taraxacum, herba et radix, D.—*Dandelion. The root (and herb, D.) of Leontodon taraxacum*, D. L.—*of Taraxacum dens-leonis*, E. Indigenous; belonging to the Natural family *Compositæ (Asteraceæ*, Lindley), and to the Linnæan class and order *Syngenesia Æqualis.*

Botanical Characters.—Root, perennial, spindle-shaped; Leaves, all radical, runcinate, glabrous, toothed; Scape, with a single, large, yellow flower.

Physical Properties.—The whole of the dandelion plant abounds in a milky juice, which is most abundant in the root in the months of August and September, at which season they should be gathered for medical use. The juice has a bitter taste but no odour.

Chemical Properties.—Dandelion juice contains resin, gum, uncrystallizable sugar, caoutchouc, various salts, and a peculiar bitter extractive, which has been recently obtained by M. Polex in a crystalline state and named by him *Taraxacine;* the latter is probably the active principle of the plant. Dandelion root and herb yield their properties to boiling water.

Therapeutical Effects.—Dandelion is a useful tonic in chronic diseases of the liver, and in other affections accompanied by derangement of the biliary organs, as in some forms of dyspepsia and of cutaneous disease. It is also held by many to be diuretic and aperient, but these effects are not produced unless it be given in very large doses.

Dose and Mode of Administration.—*Decoctum Taraxaci*, D. E. (Taraxacum herb and root, fresh, ʒiv. (ʒvii., E.); water, ℔ij. (Oij., E.); boil down to ℔j. (Oj. E.); squeeze and strain). Dose, fʒi. to fʒij.—*Extractum Taraxaci*, D. L. E. ("Proceed as for extract of gentian, employing the fresh root (and herb, D.)," D. L.—"Fresh dandelion root, ℔i.; boiling water, cong. j.; proceed as for extract of poppy heads," E.). When properly prepared this extract is of a fine brown colour, and has a bitter, not *sweet*, taste. Dose, gr. x. to ʒss.—*Liquor Taraxaci.* (Fresh dandelion roots, cleaned dried and sliced, ʒxij.; infuse for 24 hours in a sufficient quantity of distilled water to cover them. Press and set aside that the fecula may subside; decant and heat the clear liquor to 180° F.; filter the liquid whilst hot, and evaporate spontaneously until the product weighs ʒxiv., to this add fʒiv. of rectified spirit). When properly prepared, this liquid resembles in colour pale sherry; it is the best preparation of dandelion. The dose of it is from min. x. to min. xl.

Incompatibles.—Acetate of lead; the sesqui-salts of iron; corrosive sublimate; nitrate of silver; and infusion of galls.

Ulmus, L. Ulmus campestris, cortex interior, D.—*Elm-bark. The inner bark of Ulmus campestris.* Indigenous; belonging to the Natural family *Cupuliferæ (Ulmaceæ,* Lindley), and to the Linnæan class and order *Pentandria Digynia.*

Botanical Characters.—A large tree, with rugged bark; Leaves, rhomboid-ovate, acuminate, wedge-shaped, and oblique at the base; Flowers, in dense heads, each subtended by a small scale.

Properties.—The inner bark alone of the elm should be used in medicine; it is of a reddish-yellow colour, inodorous, with a bitter, somewhat astringent taste. It contains resin, gum, tannin, mucus-extractive and some salts. Its active principles are extracted by boiling water.

Therapeutical Effects.—Elm bark is at present but little employed in medicine, it is a feeble tonic; the decoction if taken in large quantity determines to the skin, and consequently has been recommended by many, in the treatment of cutaneous affections occurring in debilitated habits; in such cases it often acts beneficially.

Dose and Mode of Administration.—Used only in the form of decoction.—*Decoctum Ulmi,* D. L. (Fresh elm bark, ℥ij. (℥iiss., L.); distilled water, *by measure* ℔ij. (Oij., L.); boil down to ℔j. (Oj., L.), and strain). Dose, f℥iv. to f℥vj. three or four times a day.

Incompatibles.—Sulphate of iron; acetate of lead; nitrate of silver; and gelatin.

Zinci oxydum.—Oxide of zinc (described in the division *Astringents),* is employed internally as a tonic in some forms of convulsive and spasmodic diseases, particularly epilepsy, in which it has been found in many instances beneficial, but its use must be persevered in for a considerable period. It may be given in powder or in pill, in doses of gr. j. or gr. ij. gradually increased to gr. x. twice daily.

Zinci sulphas.—*Sulphate of Zinc* (described in the division *Astringents),* has been also administered as a tonic in spasmodic diseases, but its utility in their treatment is very doubtful.

# CHAPTER XXII.

## SUPPLEMENTARY AGENTS.

In this chapter are included the different articles which, though not employed in medicine for their remediate powers, are in frequent use as *Colouring agents, Perfumes, Tests,* and *Pharmaceutical agents.*

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### Ammoniæ oxalas, E.—*Oxalate of Ammonia.*

**Preparation.**—*Edin.*—"Oxalic acid, ℥iv.; carbonate of ammonia, ℥viij.; distilled water, Oiv.; dissolve the carbonate in the water, add gradually the acid, boil, and concentrate sufficiently for crystals to form on cooling."

This salt is not used in medicine. It was introduced into the last edition of the *Edinburgh Pharmacopœia,* as a test for lime and its salts, with which it forms a white precipitate, soluble in nitric acid, but only sparingly soluble in muriatic acid.

### Aqua destillata, L. E. Aqua distillata, D.—*Distilled Water.*

**Preparation.**—*Dub.*—"Water, ℔xx.; put into a glass retort, and having rejected the first pound which comes over, distil with a moderate heat, cong. j." *Lond.*—"Water, cong. x.; first let Oij. distil, which being thrown away, let cong. viij. distil. Keep the distilled water in a glass vessel." *Edin.*—"Take any convenient quantity of spring water, distil it from a proper vessel, rejecting the first twentieth, and preserving the first half of the remainder."

Spring and river water contain foreign matters, which render them unfit for many pharmaceutical purposes, and as vehicles for many medicines; the above processes for their purification are therefore directed by the Colleges. In the *Edinburgh Pharmacopœia,* the following tests for the purity of distilled water are given:—"Free of colour and odour, unaltered by sulphuretted hydrogen or nitrate of silver, nitrate of baryta, or oxalate of ammonia."

### Argentum, D. L. E.—*Silver. Metallic Silver.*

Silver is employed in pharmacy for preparing the nitrate. As met with in the shops, it usually contains traces of gold, copper, and lead; its freedom from which, being desirable for the above purpose, the following tests for its purity are given:—*Lond. Edin.,* "Entirely soluble in diluted nitric acid; this solution treated with an excess of solution of muriate of soda, gives a white precipitate entirely soluble in aqua ammonia, and a fluid which is not affected by sulphuretted hydrogen. (Sp. gr. 10·4, L.)."

ARGENTI CYANIDUM, L.—*Cyanide of Silver. Hydrocyanate of Silver.*

PREPARATION.—*Lond.*—"Nitrate of silver, ʒij. ʒij.; diluted hydrocyanic acid, and distilled water, of each, Oj.; dissolve the nitrate of silver in the water, and add to them the diluted hydrocyanic acid, and mix. Wash what is precipitated with distilled water and dry it."

This preparation has been introduced into the London Pharmacopœia, as a source of hydrocyanic acid, (see page 250).

ARGENTI AMMONIATI SOLUTIO, E. *Solution of Ammoniaco-nitrate of Silver.*

PREPARATION.—*Edin.*—"Nitrate of silver, gr. xliv.; distilled water, fʒj.; aqua ammoniæ, q. s.; dissolve the salt in the water, and add the aqua ammoniæ gradually, and towards the end cautiously, till the precipitate at first thrown down is nearly, but not entirely redissolved."

This solution is employed as a very delicate test for arsenious acid, (see page 120).

AURANTII FLORES, L. CITRUS AURANTIUM, FLORES, D.—*Orange flowers. The flowers of Citrus aurantium.*

AURANTII OLEUM, L. E.—*Oil of orange. Oil of Neroli. The oil distilled from the flowers of Citrus aurantium,* L.—*Volatile oil of the flowers of Citrus vulgaris, and sometimes of Citrus aurantium,* E.

AURANTII AQUA, L. E.—*Orange-flower water. Distilled water of the flowers of Citrus vulgaris, and sometimes of Citrus aurantium.*

The *Citrus aurantium* has been described in the division *Refrigerants,* and the *Citrus vulgaris,* in the division *Tonics.* Orange flowers have a very agreeable odour which depends on volatile oil; it is completely dissipated by drying. The volatile oil may be procured by distillation with water; it is imported into Britain from France and the South of Europe. It has been introduced into the London and Edinburgh Pharmacopœias on account of its agreeable odour, and as an agent for the extemporaneous preparation of orange-flower water.

Orange-flower water is an article of the Materia Medica in the Edinburgh Pharmacopœia, it being usually imported; the London College has given the following formula for its preparation.—*Aqua Florum Aurantii,* L. "Orange flowers, ℔x.; proof spirit, fʒvij.; water, cong. ij.; let a gallon distil." It is only employed on account of its fragrant odour as a vehicle for other medicines. As imported it is often impure and frequently contains traces of lead or copper; its purity may be known by "its being nearly colourless, and unaffected by sulphuretted hydrogen gas," *Edinburgh Pharmacopœia.*

BARYTÆ CARBONAS, L. E.—*Carbonate of Baryta.* This substance is found native in many parts of England, and is known to mineralogists by the name of *Witherite.* It is introduced into the pharmacopœias as being employed for the preparation of muriate of baryta. It acts as a narcotico-acrid poison on animals and on man.

Barytæ nitras, E.—*Nitrate of Baryta.*

Preparation.—Barytæ nitras, E. "To be prepared like the muriate of baryta, substituting pure nitric for muriatic acid." Solutio Barytæ nitratis, E. "Nitrate of baryta, 40 grains; distilled water, 800 grains; dissolve the salt in the water, and keep the solution in well closed bottles."

This salt is not used in medicine; it is directed to be employed by the Edinburgh College as a test, and formulæ are given for its preparation and also for a solution of a given strength.

Barytæ sulphas, D. E.—*Sulphate of Baryta. Heavy Spar.* Not employed in medicine; used in pharmacy for the preparation of the muriate of baryta.

Bergamii oleum, L. Bergamotæ oleum, E.—*Oil of Bergamot. The oil distilled from the rind of the fruit of Citrus limetta bergamium,* L.—*Volatile oil of the rind of the fruit of Citrus limetta,* E. The bergamot citrus is cultivated in the South of Europe, and belongs to the Natural family *Aurantiaceæ,* and to the Linnæan class and order *Polyadelphia Polyandria.*

Oil of bergamot exists in the rind of the fruit, from which it is obtained either by expression or distillation; it is imported from the South of Europe. It is of a pale greenish-yellow colour, has a peculiar fragrant odour, and a warm pungent taste. Its Sp. gr. is 0·862. It is only employed in medicine as a perfume, chiefly to give an agreeable odour to ointments.

Bismuthum, D. L. E.—*Bismuth. Metallic Bismuth.*

This metal is only employed in pharmacy for preparing the trisnitrate. As met with in the shops it frequently contains traces of copper or iron; its freedom from which being requisite for the above purpose, the following tests for ascertaining its purity are given by the London and Edinburgh Colleges:—"It is dissolved by diluted nitric acid; when subnitrate of bismuth is precipitated from this solution by ammonia, the liquor is free from colour. Its sp. gr. is 9·8," L.—"Entirely soluble in nitric acid with the aid of heat; and the solution is colourless or nearly so, and deposits a white powder when much diluted with cold water," E.

Calcis phosphas præcipitatum, D.—*Precipitated phosphate of Lime. Bone-phosphate of Lime. Sub-phosphate of Lime.*

Preparation.—"Bones calcined and reduced to powder, 1 part; dilute muriatic acid, and water, of each, 2 parts; digest together for 12 hours and strain the liquor; add to it sufficient water of caustic ammonia to throw down the phosphate of lime. Wash this with abundance of water, and dry it."

Bone-phosphate of lime is composed of 8 eq. of lime, and 3 of phosphoric acid ($8CaO+3PO^5$). It was formerly employed in medicine, in

rickets and mollities ossium on the supposition of its affording bone-earth to the osseous system; the fallacy of such a doctrine is well understood now, and at present it is only used in pharmacy for preparing phosphorus and phosphate of soda.

CARBO ANIMALIS, L. E.—*Animal-charcoal. Ivory-black obtained from bones (and flesh,* L.).

Animal charcoal is usually prepared by calcining the bones of animals in close vessels; thus obtained, it contains phosphate and carbonate of lime, which would unfit it for the purposes to which it is applied in pharmacy, namely, that of acting as a decolorizing agent in the preparation of the vegetable alkaloids; processes are consequently given in the pharmacopœias for purifying the commercial article.

PREPARATION.—CARBO ANIMALIS PURIFICATUS, L. E. "Animal charcoal, ℔j.; hydrochloric acid, and water, of each, f℥xij.; mix the hydrochloric acid with the water, and pour it gradually upon the charcoal, then digest for two days with a gentle heat, frequently shaking them. Set by, and pour off the supernatant liquor, then wash the charcoal very often with water, until nothing acid is precipitated; lastly, dry it," L. "Ivory-black, ℔j.; commercial muriatic acid, and water, of each, f℥xij.; mix the acid and water, add gradually the ivory black, stirring occasionally. Digest with a gentle heat for two days, agitating from time to time; then boil, dilute with two pints of water, collect the undissolved charcoal on a filter of linen or calico, and wash it with water till what passes through scarcely precipitates with solution of carbonate of soda. Heat the charcoal first moderately and then to redness in a closely covered crucible," E.

After animal charcoal has been employed as a decolorizing agent, it loses its powers as such; which, however, may be again restored to it by drying and heating to redness. When properly prepared, "if it be incinerated with its own volume of red-oxide of mercury, it is dissipated leaving only a scanty ash," *Edinburgh Pharmacopœia.*

CARBO LIGNI, D. L. E.—*Wood-charcoal.*

Wood-charcoal is obtained by burning billets of wood, the access of air being prevented. It is an article of the Materia Medica in the three Pharmacopœias, being prepared on the large scale for various uses in the arts, particularly for the manufacture of gunpowder. In medicine it is at present only employed to destroy fetor; for which purpose it is used in the form of powder or poultice to gangrenous sores, phagedenic ulcers, &c.; it is also used as a dentifrice, for which it is very generally employed, as by its mechanical action it removes incrustations from the teeth, and by its antiseptic powers it corrects fetor of the breath. Charcoal has been employed in the treatment of various diseases, but the only one in which it is ever employed in this country is dysentery, and it is merely to correct the fetor of the evacuations, for which purpose it is given in doses of gr. xx. frequently repeated.—*Cataplasma Carbonis ligni,* D. (Take of wood-charcoal, red hot, and just extinguished by pouring dry sand over it, q. s.; reduce it to very fine powder and add it to the simple cataplasm (see page 182) warmed). For gangrenous and fetid sores.

Cocci, L. E. Coccus cacti, D.—*Cochineal. The entire insect, Coccus cacti.* A native of Mexico; belonging to the class *Insecta,* order *Hemiptera.* The cochineal insect and the plant on which it feeds have been recently introduced into Algeria; and France is now to a great extent supplied with cochineal from that colony.

The cochineal insect feeds chiefly on the Nopal plant *(Opuntia cochinillifera),* large plantations of which are cultivated for its nourishment in Mexico. They are collected three times a year, killed by immersion in boiling water, and dried with stove-heat; the first gathering is the best, consisting entirely of impregnated females, when they are of the largest size, and afford more colouring matter. As met with in commerce, cochineal is in the form of small roundish grains (each grain being a separate insect); they are wrinkled, from one to two lines long, and of a silvery-purplish colour. They are inodorous, but have a rather bitter taste. Cochineal consists of some peculiar fatty substance and a brilliant purplish-red colouring matter which has been named *cochinillin;* and which is a principal constituent in the pigment, technically known as *carmine.*

Cochineal was at one time supposed to possess anodyne properties and was employed in medicine in the treatment of hooping-cough and neuralgia; and, as a remedy for the former disease, its use has been again resorted to of late years on many parts of the Continent, particularly in Germany. In this country, however, it is at present only used as a colouring agent.

Cornu, L. E. Cornua cervina, ramenta, D.—*Hartshorn shavings. The Horns of Cervus Elaphas.*

Hartshorn shavings are introduced into the Materia Medica as being employed in the preparation of antimonial powder (see page 128); boiled with water, they form a jelly similar to that obtained from cow-heels, calves' feet, &c. Calcined hartshorn is officinal in the London and Dublin Pharmacopœias; it is nearly similar in composition to the *bone-phosphate of lime,* and was used for the same purposes (See page 423).—*Pulvis Cornu Cervini usti,* D. *Cornu ustum,* L. "Burn pieces of hartshorn in an open vessel until they become perfectly white; and then (proceeding as for *prepared chalk,* L.) reduce them to very fine powder," D. L.

Curcuma, L. E. Curcuma longa, radix, D.—*Turmeric. Root (Rhizome,* L. E.) *of Curcuma longa.* A native of the East Indies, and of China; belonging to the natural family *Zingiberaceæ,* and to the Linnæan class and order *Monandria Monogynia.*

Turmeric is in short, roundish, somewhat curved pieces, about the thickness of the little finger, reddish-yellow externally, reddish-brown within; they have a peculiar aromatic odour, and a warm bitter taste. The colouring principle of turmeric has been obtained in a separate state by treating the alcoholic extract with ether; it has been named *curcumin.* Turmeric possesses some aromatic properties in consequence of which, as well as its colour, it is an ingredient in *curry*-powder. It is not em-

ployed as a medicine, but is generally used as a testing agent for alkalies, which change its yellow colour to reddish-brown. For this purpose *Turmeric paper* is employed; it is prepared by soaking white *unsized* paper in a decoction (obtained by boiling ℥i. of coarsely powdered turmeric in f℥xii. of water, straining through a cloth and allowing the fluid to settle for a few minutes), and drying.

FERRI SULPHURETUM, D. E.—*Sulphuret of Iron.*

PREPARATION.—*Dub.*—"Expose a rod of iron to the strongest heat of a forge till it becomes white hot, and having removed it from the fire apply it instantly to a solid mass of sulphur. Receive the sulphuret of iron (which drops) in water, and having separated it from the sulphur, keep in well-closed vessels." *Edin.*—"Iron filings, 3 parts; sublimed sulphur, 1 part; mix them thoroughly; heat the mixture in a covered crucible till it becomes red hot; remove the crucible from the fire and allow the action to go on without heat. A much purer sulphuret may be obtained by a process similar to that ordered by the Dublin college."

Sulphuret of iron is not used in medicine; it is employed in pharmacy for the preparation of sulphuretted hydrogen gas.

LACMUS, L. E. LITMUS, D.—*Litmus. A prepared colouring matter from Rocella tinctoria,* E. *The plant (prepared Thallus,* L.) *of Rocella tinctoria,* D. L. *(Also obtained from Rocella fusiformis,* Lindley.) Natives of the Mediterranean and Channel islands; belonging to the Natural family *Lichenaceæ (Lichenales,* Lindley), and to the Linnæan class and order *Cryptogamia Algæ.*

It is probable that these are not the only lichens employed in the preparation of litmus, but the plants used, as well as the exact process followed, is kept secret by the manufacturers. Sir Robert Kane, who has bestowed much attention on the subject, states that the lichens employed are ground with water to form a uniform pulp, and sufficient water added to make the whole into a thick fluid: ammoniacal liquors from time to time mixed with this, the whole being exposed to the air and frequently agitated: when it has acquired the requisite shade of blue, chalk and plaster of Paris are added to the liquor so as to form a consistent paste, which, when cut into little cubical masses and dried, forms the litmus of commerce. It is not employed in medicine; in pharmacy it is used as a test for acids and alkalies, its colour being changed to red by the former, and the original blue tint again restored by the latter. *Litmus paper* is prepared in a similar manner to *Turmeric paper* (see above).

LYCOPODIUM. *A powder contained in the spore cases of Lycopodium clavatum and Lycopodium selago. Vegetable brimstone.* These two species of club-moss belong to the Natural family *Lycopodiaceæ.*

Lycopodium is an extremely fine, very light powder, of a delicate yellow colour, inodorous and tasteless. It is exceedingly inflammable,

burning like gunpowder, on which account it is used in the preparation of fire-works. It is commonly employed in France for rolling pills in, to facilitate their formation and to prevent them from adhering; and for this purpose it is far superior to liquorice powder or magnesia which are ordinarily used for the purpose in this country. Pills coated with lycopodium may be put into water without being injured.

MANGANESII OXIDUM, E. MANGANESII BINOXYDUM, L.—*Black oxide of Manganese. Peroxide of Manganese.* Found native in some parts of England and Scotland; it is known to mineralogists under the name of *Pyrolusite.*

It is only used as a pharmaceutical agent, at least in this country, being employed in the preparation of oxygen, chlorine, and iodine.

OSSA, D.—*Bones.*

Bones are an article of the Materia Medica in the Dublin pharmacopœia; they are employed in the preparation of animal charcoal, the *Calcis phosphas præcipitatum,* and the *Sodæ phosphas* of the pharmacopœias.

PLUMBI CHLORIDUM, L.—*Chloride of Lead.*

PREPARATION.—"Acetate of lead, ℥xix.; boiling distilled water, Oiij.; chloride of sodium, ℥vj.; Dissolve the acetate of lead and chloride of sodium separately; the former in three pints of distilled water, and the latter in one pint of distilled water. The liquors being then mixed together, wash what is precipitated with distilled water, when it is cold, and dry it."

This salt is employed by the London College in the preparation of the *hydrochlorate of morphia.* It is not used in medicine.

PLUMBI NITRAS, E.—*Nitrate of Lead.*

PREPARATION.—"Litharge, ℥ivss.; dilute nitric acid, Oj.; Dissolve the litharge to saturation with the aid of a gentle heat; filter, and set the liquor aside to crystallize. Concentrate the residual liquor to obtain more crystals."

This salt is employed by the Edinburgh College for the preparation of *iodide of lead;* and as a test for ascertaining the purity of *bitartrate of potash,* (see page 92); it is not used in medicine.

PLUMBI OXYDUM HYDRATUM, L.—*Hydrated oxide of Lead.*

PREPARATION.—"Solution of diacetate of lead, Ovj.; distilled water, cong. iij.; solution of potash, Ovj., or as much as may be sufficient to precipitate the oxide; mix; wash with water what is precipitated until nothing alkaline remains."

It is employed by the London College in preparing the *disulphate of quina;* but it is not used in medicine.

Plumbi oxidum rubrum, E.—*Red-oxide of Lead. Minium.*

Red lead is employed by the Edinburgh College for purifying the strong acetic acid (see page 114), and for preparing *Aqua Chlorinei.* It is not used in medicine.

Potassii ferrocyanidum, L. E.—*Ferrocyanide of Potassium.*

This salt has been used by some physicians in America as a sedative, but the results obtained from it are very uncertain, and it would appear to be rather an inert substance. It has been introduced into the pharmacopœias as being a cheap material for preparing hydrocyanic acid, (see page 250).

Pterocarpus, L. E. Pterocarpus santalinus, lignum, D.—*Red-sandal wood. Wood of Pterocarpus santalinus.* A native of Ceylon; belonging to the Natural family *Leguminosæ (Fabaceæ,* Lindley), and to the Linnæan class and order *Diadelphia Decandria.*

Red-sandal, or as it is often called, Red-saunders wood, is contained in the Pharmacopœias, only as being employed as a colouring ingredient in the *compound spirit of Lavender.*

Rosa centifolia, petala, D. L. E.—*Petals of Rosa centifolia.*

Rosæ oleum, E. *Attar or Otto of roses. Volatile oil of the petals of Rosa centifolia.*

The hundred-leaved or Cabbage-rose, originally a native of Asia, is now cultivated freely in our gardens. It belongs to the Natural family *Rosaceæ,* and to the Linnæan class and order *Icosandria Polygynia.*

The pharmaceutical preparations of this rose are employed in medicine as perfumes for giving an agreeable odour to mixtures, &c.; the volatile oil introduced into the last edition of the Edinburgh Pharmacopœia is too expensive an article for general use. Laxative properties have been ascribed by some to the syrup, but they probably depend on the sugar which it contains.

Pharmaceutical Preparations.—*Aqua Rosæ,* D. L. E. ("Petals of rosa centifolia, ℔viij.; water, sufficient to prevent empyreuma; distil one gallon," D.—"Petals of rosa centifolia, ℔x.; proof (rectified, E.) spirit, f℥vij. (f℥iij., E.); water, cong. ij.; mix and distil a gallon," L. E. ["The petals should be preferred fresh; but it also answers well to use those which have been preserved, by beating them with twice their weight of muriate of soda," E.])—*Syrupus Rosæ,* D. L.—*Syrupus Rosæ centifoliæ,* E. (Petals of rosa centifolia, dried (fresh, E.), ℥vij. (℔j. E.); boiling water, *by measure* ℔iv. (Oiij., L E.); pure sugar, ℔ix. ℥viij. (℔vi., L. ℔iij., E.); macerate (infuse, E.) the petals in the water for 12 hours and strain; [evaporate the strained liquor to ℔iiss. (Oij., L.), in a water-bath, D. L.] and then add the sugar, and (with the aid of heat, D. E.) dissolve it). Syrup of roses is sometimes employed as a laxative for newly-born infants, in doses of f℥ij. or f℥iij.

Sambuci nigræ, flores, D. L. E.—*Flowers of the Common Elder.*

A water distilled from elder flowers is sometimes used, in consequence of its agreeable odour, as a vehicle for other medicines. It is officinal in the London and Edinburgh Pharmacopœias, and is obtained as follows:—*Aqua Sambuci*, L. E.—*Elder flower water.* "Elder flowers, ℔x.; (*or* oil of elder, ℥ij., L.); proof (rectified, E.) spirit, f℥vij. (f℥iij., E.); water, cong. ij.; mix and distil a gallon."

Sodæ phosphatis solutio, E.—*Solution of Phosphate of Soda.*

Preparation.—"Phosphate of soda, free of efflorescence, 175 grains; distilled water, f℥viij.; dissolve the salt in the water and keep the solution in well closed bottles."

Phosphate of soda has been described in the division *Cathartics;* this solution is only employed as a test.

Zincum, D. L. E.—*Zinc. Metallic Zinc.*

Zinc is employed in pharmacy for preparing the different compounds of the metal which are used as medicines. As met with in commerce it frequently contains many impurities, as carbon, iron, copper, arsenic, &c. The London and Edinburgh Colleges have therefore given the following tests, by which it may be ascertained if it is sufficiently pure for the above purpose:—"Almost entirely dissolved by dilute sulphuric acid, and the solution is colourless; what is thrown down from the solution by ammonia is white, and when the ammonia is added in excess, it is again dissolved. The specific gravity of the metal is 6·86," L.—"It dissolves in a great measure in diluted sulphuric acid, leaving only a scanty grayish-black residuum. This solution presents the characters of the solution of sulphate of zinc," E.

# APPENDIX A.

## FORMULÆ.

*The following Formulæ are principally confined to the new remedies which are described in this work, or to those as yet not in general use.*

The prescriptions not contained in the first edition, are marked with an asterisk.

### ANTACIDS.

℞ Aquæ Ammoniæ, min. x.; Infusi Chirettæ, f℥i.; Tincturæ Aurantii, f℥ij. M. Fiat haustus, mane meridieque sumendus. (A useful antacid draught in the dyspepsia of the debilitated, attended with acid eructations.)

℞ Ammoniæ Bicarbonatis, gr. viij.; Infusi Calumbæ, f℥i.; Tincturæ Humuli, f℥i.; Tincturæ Hyoscyami, min. xx. M. Fiat haustus, bis quotidie sumendus. (Less stimulating than the former, and better adapted for cases in which the stomach is irritable.)

℞ Ammoniæ Carbonatis, gr. xxiv.; Fellis Bovini Inspissati, ℥ss.; Mucilaginis, q. s. M. Fiant pilulæ duodecim; Capiat unam ter in die. (In dyspepsia accompanied by vomiting of food and constipation.)

℞ Aquæ Ammoniæ Carbonatis, f℥ss; Infusi Cascarillæ, f℥vij.; Spiritus Ætherei Nitrosi, f℥i.; Spiritus Cinnamomi, f℥iij. M. Fiat mistura, de quâ sumantur cochlearia ij. ampla ter in die. (In the lithic acid diathesis, with debility of the digestive organs.)

℞ Aquæ Calcis, f℥iv.; Confectionis Aromaticæ, ℥ij.; Tere simul et gradatim adde, Misturæ Amygdalarum, f℥iiiss.; Aquæ Lauro-cerasi, f℥i. M. Fiat mistura; Capiat cochlearia ij. ampla bis terve in die, phialâ priús concussâ. (Useful in cardialgia and in gastrodynia.)

* ℞ Aquæ Calcis Effervescentis (*Carrara water*, page, 6); Lactis Recentis, ana, f℥ij.; fiat haustus, ter quaterve in die sumendus. (In dyspepsia, with much irritability of the stomach, and cardialgia.)

℞ Misturæ Cretæ, f℥vi. ; Tincturæ Humuli, f℥i. ; Tincturæ Cardamomi, f℥vij. ; Vini Opii, f℥i. M. Capiat semiunciam sextis horis. (In diarrhœa dependant on acidity of the *primæ viæ.)*

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℞ Pulveris Cretæ compositi, gr. xviij. ; Carbonatis Sodæ siccati, gr. vj. ; Pulveris Tragacanthæ, gr. xij. M. Divide in partes sex æquales, quarum capiat unam quâque secundâ vel tertiâ horâ. (In the diarrhœa of children.)

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℞ Aquæ Magnesiæ Bicarbonatis, f℥ss. ; Spiritus Lavandulæ compositi, f℥ij. M. Fiat haustus, sumat statim et repetatur semihorio si opus sit. (An excellent remedy in heart-burn.)

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℞ Solutionis Alkalinæ *(Brandish)*, f℥v. ; Infusi Chirettæ, f℥viij. ; Spiritus Anisi compositi, f℥iij. ; Syrupi Aurantii, f℥i. M. Fiat mistura ; Capiat cochlearia ij. magna ter in die. (In the lithic acid diathesis.)

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* ℞ Liquoris Potassæ effervescentis, f℥iv. ; Tincturæ Chirettæ ; Tincturæ Humuli, ă ă, f℥ss. ; Fiat haustus, ex effervescentiâ sumendus, et repetatur ter in die. (An excellent antacid draught in dyspepsia with deposit of lithates in the urine. This draught is best prepared by putting the tinctures mixt together into a tumbler, and pouring the effervescing potash water on them ; it should be swallowed immediately.)

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* ℞ Liquoris Potassæ effervescentis, f℥iij. ; Vini Seminum Colchici, min. xx. ; Tincturæ Cardamomi compositæ, f℥ss. Fiat haustus ter in die sumendus. (In dyspeptic affections occurring in gouty habits : see observations on last prescription, for preparation.)

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℞ Sodæ Bicarbonatis, gr. x. ; Infusi Calumbæ, f℥iss. ; Aquæ Lauro-cerasi, min. xij. ; Creasoti, min. j. M. Fiat haustus sextis horis sumendus, et ad tertiam vel quartem vicem repetendus si opus sit. (In acidity of the stomach with vomiting.)

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℞ Sodæ Carbonatis siccati, ℥ss. ; Pulveris Myrrhæ, gr. xviij. ; Pulveris Ipecacuanhæ, gr. iij. M. Divide in chartulas vj. quarum unam sumat quartâ quâque horâ. (An excellent antacid in chronic diarrhœa and dysentery.)

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## ANTHELMINTICS.

℞ Syrupi Allii sativi, (page 17), f℥i. ; Olei Terebinthinæ, f℥ss. ; Decocti Hordei, f℥vij. M. Fiat enema, injiciatur statim, et horæ unius spatio adhibeatur enema catharticum. (For ascarides in the rectum ; Half or a fourth part of the above may be used for children.)

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℞ Artemisiæ Santonicæ, gr. xxx.; Calomelanos, gr. vj.; Muriatis Sodæ, gr. xij.; Saponis Jalapini, (page 85), gr. xxiv.; Mellis Despumati, q. s. M. Divide in bolos, ij.; Sumat unum mane, et alterum post horas sex, nisi priùs benè dejecerit alvus. (In cases of lumbrici or ascarides.)

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℞ Decocti Geoffroyæ, f℥i.; Infusi Gigartinæ, (page 19), f℥iss.; Tincturæ Valerianæ; Syrupi Zingiberis, ă ă, f℥ij. M. Fiat mistura, Capiat partem tertiam trihorio. (For expelling lumbrici.)

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℞ Olei Filicis-maris, (page 19), min. xxx.; Misturæ Amygdalarum, f℥ij. M. Fiat emulsio, et divide in partes æquales ij., quarum sumatur una horâ somni, et altera mane sequente. (A most efficacious anthelmintic for the *tape worm*. If it do not purge, an active cathartic should be given in four hours after the second dose.)

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* ℞ Mucunæ, ℥ss.; Pulveris Tanaceti, ℥j.; Syrupi, f℥ss.; in mortario terendo misce intimé. (An excellent anthelmintic in cases of lumbrici; the above quantity should be administered for three successive mornings before breakfast, and the third dose followed by an active mercurial purge.)

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℞ Granati radicis corticis, ℥iij.; Pulveris Sabadillæ, gr. vj.; Pulveris Aromatici, ℥ss. M. Divide in pulveres sex, Capiat unum omni semihorâ ad sextam vicem. (In cases of tænia; the last dose should be followed by an active saline purge.)

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℞ Pulveris Spigeliæ, gr. x.; Pulveris Stanni, ℥ij.; Syrupi Zingiberis, f℥ss.; Mellis, q. s. M. Fiat Bolus, horâ ante jentaculum sumendus, et per dies tres repetendus; postea adhibeatur mistura purgans ad plenam alvi solutionem. (In cases of lumbrici.)

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* ℞ Infusi Tanaceti, f℥iss; Decocti Geoffroyæ, f℥ss.; Syrupi Zingiberis, f℥i. M. Fiat haustus. (An effectual anthelmintic in cases of lumbrici; its effects must be carefully watched.—See page 18.)

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## ANTISPASMODICS.

℞ Tincturæ Fuliginis, f℥ss.; Misturæ Camphoræ cum Magnesiâ, f℥viss.; Syrupi Aurantii, f℥j. M. Fiat mistura, Capiat unciam omni horâ donec abierit spasmus. (In the hysteria of females.)

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℞ Spiritus Fuliginis, f℥ss.; Aquæ Sodæ carbonatis, f℥ij.; Syrupi Aurantii, f℥iss.; Aquæ Menthæ pulegii, f℥iss. M. Fiat mistura, sumat cochleare medium tertiis vel quartis horis. (In the advanced stages of hooping-cough in children; a tea-spoonful for infants.)

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* ℞ Extracti Fuliginis, gr. xxx.; Pilulæ Galbani compositæ, ℈j.; Olei Valerianæ, min. x.; M. Divide in pilulas duodecim, quarum capiat duas ter in die. (In hysterical neuralgia in females.)

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℞ Tincturæ Galbani f℥i.; Spiritus Ammoniæ aromatici, f℥ss.; Misturæ Moschi, f℥j. M. Fiat haustus. (A useful antispasmodic in hysteria and spasmodic colic.)

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℞ Tincturæ Castorei compositæ, f℥v.; Ætheris Sulphurici, f℥iij.; Misturæ Moschi, f℥vij. M. Fiat mistura, de quâ sumatur cochleare unum magnum secundis horis, donec evanescant symptomata. (In cramp of the stomach, in spasmodic or flatulent colic, in hysteria, in hiccup, in nervous palpitations, &c.)

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* ℞ Pilulæ Sagapeni compositæ, gr. xl.; Olei Rutæ, min. xv.; fiant pilulæ duodecim. Capiat duas vel tres pro dosi. (In the flatulent colic of hysteria.)

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* ℞ Zinci Valerianatis, gr. viij.; Tincturæ Valerianæ, f℥ij.; Aquæ Florum Aurantii, f℥iiiss.; Syrupi Hemidesmi (page 180), f℥ij.; fiat mistura cujus capiat semiunciam sextis horis. (An excellent mixture in hysteria, chorea and other nervous affections.)

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## ASTRINGENTS.

℞ Aceti Destillati, f℥ij.; Aquæ Lauro-cerasi, f℥ij.; Syrupi Rhœados, f℥vj.; Aquæ destillatæ, f℥v. M. Fiat mistura, cujus capiat cochlearia duo ampla sextis horis. (An excellent sedative astringent in chronic mucous or purulent discharges, attended with much debility and irritability of the stomach.)

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* ℞ Acidi Gallici, gr. xx; Mucilaginis Acaciæ, f℥ij.; Aquæ destillatæ, f℥iiiss.; Syrupi Rhœados, f℥ij.; M. Fiat mistura, de qua sumatur uncia secundis vel tertiis horis. (In hemorrhage from the kidneys or bladder.)

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℞ Acidi Sulphurici aromatici, f℥iiss.; Syrupi Rosæ, f℥vss.; Syrupi Hemidesmi Indici, (page 180), f℥ss.; Aquæ destillatæ, f℥viss. M. Fiat mistura, sumat unciam sextis horis. (A useful astringent mixture in passive hemorrhages, and in the colliquative sweating of hectic.)

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℞ Tincturæ Cinnamomi compositæ, f℥iij.; Acidi Sulphurici diluti, f℥ij. Fiat mistura, cujus capiat guttas xx. ter in die, ex cyatho Decocti Hordei. (In the same cases as the above mixture.)

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℞ Aluminis, ℥iss.; Syrupi Rosæ, f℥j.; Aquæ Rosæ, f℥vij. M. Fiat mistura, cujus sumat cochleare amplum tertiis vel quartis horis. (In old cases of diarrhœa, and in painter's colic.)

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℞ Infusi Rosæ acidi; Decocti Althææ, ana, f℥iij.; Aluminis, ℥j.; Mellis Rosæ, f℥ij. M. Fiat gargarisma, sæpè utenda. (A useful gargle in relaxed sore throat, and in chronic ulcerations of the mouth and fauces.)

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* ℞ Creasoti, min. j.; Spiritus Juniperi compositi, min. xx.; Aquæ destillatæ, f℥i. M. Fiat haustus, secundis vel tertiis horis sumendus. (In chronic diarrhœa with vomiting.)

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℞ Creasoti, min. iv.; Tincturæ Gallarum, f℥ij.; Aquæ destillatæ, f℥ij. M. Fiat lotio. (In indolent ulcers with excessive discharge.)

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℞ Sulphatis Ferri; Carbonatis Potassæ, ana, ℥ss.; Mucilaginis Gummi Tragacanthæ, q. s. Fiat massula et divide in pilulas, xij.; Capiat unam ter in die. (An excellent remedy in leucorrhœa.)

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℞ Ferri Pernitratis, f℥ij.; Syrupi Simplicis, f℥vj.; Aquæ destillatæ, f℥iij. M. Capiat cochleare amplum sextis horis. (A very useful astringent and tonic mixture in chronic mucous diarrhœa, and in leucorrhœa.)

---

℞ Sulphatis Cupri, gr. vj.; Pulveris Myrrhæ, gr. xij.; Conservæ Rosæ, ℈ij. M. Divide in pilulas, xij., Sumat unam sextis horis. (In chronic diarrhœa and dysentery.)

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℞ Tincturæ Gallarum, f℥j.; Misturæ Amygdalarum, f℥iss.; Mucilaginis, f℥ss.; Aquæ, f℥v. M, Capiat cochleare amplum post singulas liquidas dejectiones. (An excellent astringent mixture in colliquative diarrhœa.)

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℞ Pulveris Kino compositi, gr. x.; Pulveris Cretæ compositi, gr. xv.; Syrupi Zingiberis, q. s. M. Fiat Bolus, sextâ quâque horâ sumendus. (In diarrhœa occurring in the old and debilitated.)

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℞ Decocti Hæmatoxyli, f℥vj.; Tincturæ Monesiæ, (page 53), f℥j.; Syrupi Aurantii, f℥j. Fiat mistura, cujus capiat cochleare amplum post singulas liquidas dejectiones. (In chronic diarrhœa and dysentery.)

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℞ Monesiæ, ℥j.; Aluminis, gr. xxiv.; Confectionis Aromaticæ, ℥ss.; Syrupi, q. s. ut fiant pilulæ xxiv.; Sumat ij. ter in die. (In leucorrhœa, in chronic diarrhœa, and in pyrosis.)

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* ℞ Tincturæ Matico, (page 53), f℥vj.; Infusi Krameriæ, f℥vij.; Syrupi Croci, f℥ij. M. Fiat mistura, cujus capiat semunciam tertiis vel quartis horis. (In chronic mucous diarrhœa, or in the diarrhœa of phthisis.)

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℞ Plumbi Acetatis; Digitalis, ana, gr. vj.; Opii, in pulvere, gr. iij.; Conservæ Rosæ, gr. xij. M. Divide in pilulas sex, e quibus una ter in die sumatur. (In active hemorrhages.)

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* ℞ Plumbi Acetatis, gr. ix.; Pilulæ e Styrace, gr. v. M. Divide in pilulas tres, quarum capiat unam tertiis vel quartis horis. (An excellent remedy in the autumnal cholera of this country.)

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℞ Decocti Bistortæ, (page 58), f℥vj.; Decocti Papaveris, f℥ij.; Acidi Tannici, gr. xviij. M. Fiat liquor, cujus quantum satis sit quater de die, ope siphunculi eburnei, in vaginam injiciatur. (In chronic leucorrhœa.)

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℞ Acidi Tannici, gr. xij.; Conservæ Rosæ, ℥ss. M Divide in pilulas xij. e quibus sumatur una quartis horis. (An excellent astringent in the colliquative sweating and diarrhœa of phthisis.)

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℞ Decocti Granati, f℥vij.; Mellis Boracis, f℥j. M. Sit gargarisma sæpè utendum. (In aphthous ulcerations of the mouth and fauces.)

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℞ Sulphatis Zinci, ℈j.; Aquæ destillatæ, f℥iv.; Tincturæ Croci, f℥ij. M. Fiat collyrium, sæpè utat. (A useful eye-wash in chronic ophthalmia.)

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℞ Pulveris Uvæ-ursi, ℥iij.; Acidi Tannici, gr. vj.; Pulveris Opii, gr. ij. M. Divide in portiones duodecim æquales; Capiat unam ter in die. (In passive hematuria, in albuminuria, and in chronic catarrh of the bladder.)

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℞ Sulphatis Zinci, gr. xxiv.; Ipecacuanhæ, gr. iv.; Pulveris Myrrhæ, gr. xxiv.; Lactucarii; Conservæ Rosæ, ana, ℥ss. M. Divide in pilulas xxiv, e quibus sumatur una sextâ quâque horâ. (In chronic diarrhœa and dysentery.)

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℞ Calcis Chlorinatæ, ℥iv.; Aquæ destillatæ, f℥xj.; Solve et cola, dein adde, Mellis Rosæ, ℥i. M. Fiat liquor, quo gingivas sæpè gargarizet. (A most efficacious gargle in excessive salivation.)

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* ℞ Tincturæ Acetatis Zinci, f℥ij.; Infusi Matico, (page 53), f℥viiss.; Mucilaginis Gummi Tragacanthæ, f℥ij.; M. Fiat injectio, frequenter utenda. (An excellent injection in the advanced stages of gonorrhœa, in gleet, and in leucorrhœa.)

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## CATHARTICS.

℞ Decocti Aloës compositi, f℥ij.; Syrupi Croci, f℥ss.; Syrupi Rhei, (page 98), f℥ss. M. Fiat mistura duabus vicibus sumenda. (In torpidity of the bowels, and in chlorosis.)

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℞ Calomelanos, gr. xxx.; Saponis Crotonis, (page 79), gr. vj.; Pilulæ Colocynthidis et Hyoscyami, gr. xxiv. M. Divide in pilulas xij. e quibus sumatur una ter de die. (In spasmodic and nervous diseases.)

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℞ Pilulæ Colocynthidis compositæ; Saponis Jalapinæ, (page 85), ana, ℥i. M. Fiat massula et divide in pilulas xxiv. e quibus sumantur duæ, prout res poscit. (A good formula for purgative pills for general use.)

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℞ Pilulæ Cambogiæ compositæ, ℈ij.; Pilulæ Hydrargyri, ℈i. M. Divide in pilulas xij.; Capiat ij. pro re natâ. (In constipation with deficient secretion of bile.)

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℞ Extracti Colchici acetici, gr. xij.; Pilulæ Hydrargyri, gr. xxx.; Extracti Hyoscyami, gr. xviij. M. Fiant pilulæ duodecim, e quibus sumantur duæ tertiâ quâque nocte. (An excellent cathartic in gouty and rheumatic habits, the following draught being administered the next morning.)

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℞ Succi Colchici, (page 76), min. x.; Magnesiæ Carbonatis, gr. xij.; Spiritus Cinnamomi, f℥ss.; Aquæ Cinnamomi, f℥iss. M. Fiat haustus. (To be given in the morning, two of the above pills having been taken the previous evening.)

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℞ Vini Seminum Colchici, f℥ss.; Tincturæ Rhei et Aloës, f℥i.; Spiritus Myristicæ, f℥ss.; Infusum Rhei, f℥vi. M. Fiat mistura, de quâ sumantur cochlearia ampla ij, tertiis vel quartis horis ad effectum. (A useful cathartic in gouty and rheumatic habits.)

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℞ Tincturæ Colocynthidis, (page 78), min. xx.; Infusi Sennæ cum Tamarindis, f℥ij.; Tincturæ Cardamomi compositæ, f℥ss. M. Fiat haustus, bis quotidie sumendus. (In dropsical cases.)

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℞ Tincturæ Elaterii, (page 81), f℥i.; Syrupi Sennæ, f℥ss.; Syrupi Zingiberis, f℥i.; Aquæ Menthæ Piperitæ, f℥i. M. Fiat haustus, quam primum sumendus et, nisi alvus sit intereà copiosè soluta, quadrihorio repetatur. (In ascites occurring in the robust, provided no inflammatory tendency be present.)

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℞ Olei Euphorbiæ Lathyris, (page 81), min. vj.; Mucilaginis Gummi Arabici, f℥ij.; Tere optimè simul, hisque inter terendum paulatim adjice, Syrupi Croci, f℥ij.; Aquæ destillatæ, f℥iss. Fiat haustus. (A safe and efficacious purgative draught.)

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℞ Saponis Crotonis, (page 79), gr. ss; Extracti Hyoscyami.; Pilulæ Hydrargyri, ana, gr. iv.; Olei Pimentæ, min. ij. M. Divide in pilulas ij. horâ somni sumat.

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℞ Tincturæ Hellebori, f℥iss.; Infusi Sennæ compositi, f℥j.; Syrupi Zingiberis, f℥ij. M. Fiat haustus, primo mane sumendus. (The above pills and draught will be found very useful in cephalalgia dependant on congestion of the vessels of the head, and accompanied by a torpid state of the bowels; also in mania.)

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℞ Hydrargyri cum cretâ, gr. xij.; Pulveris Scammonii, gr. xij.; Carbonatis Sodæ siccati, gr. vj.; Pulveris Aromatici, gr. xij. M. Divide in portionibus paribus vj., e quibus sumatur una omni mane. (An excellent alterative and cathartic for children; very useful in worm cases.)

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℞ Lini Cathartici, herbæ recentis, ℥iij.; Aquæ ferventis, f℥ij.; Digere per horas duas in vase clauso, cola et adde, Tincturæ Cardamomi compositæ, f℥i. Fiat haustus. (In simple constipation.)

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℞ Resinæ Jalapæ, (page 85), gr. v.; Confectionis Amygdalarum, gr. xxx.; Simul terantur, hisque inter terendum adde, Aquæ destillatæ, f℥iss. M. Fiat haustus, illicò sumendus. (An excellent cathartic in simple constipation.)

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℞ Sulphatis Magnesiæ, ℥vj.; Infusi Rosæ acidi, f℥ij. M. Fiat haustus. (An excellent purgative draught in mild febrile and inflammatory affections, accompanied by constipation.)

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* ℞ Manganesiæ Sulphatis, (page 88), ℥iv.; Vini Seminum Colchici, min. xxx.; Aquæ Rosæ, f℥iv.; M. Fiat haustus. (A useful purgative draught in gouty or rheumatic habits.)

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* ℞ Manganesiæ Sulphatis, ℥iv.; Acidi Sulphurici diluti, min. viij.; Infusi Sennæ compositi, f℥ij.; M. Fiat haustus. (An excellent purgative draught in dyspeptic affections with deficient secretion of bile.)

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℞ Mannitæ, (page 89), ℥ss.; Aquæ Menthæ piperitæ, f℥ss. Solve; Fiat haustus. (An excellent laxative for children.)

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℞ Potassæ Sulphatis, ℈ss.; Acidi Sulphurici diluti, min. v.; Aquæ Rosæ, f℥ij. M. Fiat haustus. (In mild febrile and inflammatory affections.)

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℞ Potassæ Bitartratis, ℥iv.; Acidi Boracici, ℥j.; Aquæ destillatæ, f℥xij. Fiat mistura, cujus sumatur pars quarta tertiâ quâque horâ ad plenam alvi solutionem. (In dropsical effusions, more especially into the abdomen.)

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℞ Potassæ Bitartratis, ℈ss.; Pulveris Jalapæ, ℥ss.; Electuarii Sennæ, ℈jss.; Extracti Sennæ fluidi, (page 106), f℥ss. M. Fiat electuarium, de quo sumat instar nucis moschatæ, ter quotidie, vel donec alvus commodè purgetur. (In hemorrhoidal affections.)

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℞ Infusi Sennæ cum Tamarindis, f℥iss.; Syrupi Rhei, (page 99), f℥ij.; Spiritus Nucis Moschatæ, f℥ss. M. Fiat mistura, de quâ sumatur cochlearia ij. ampla secundis horis donec alvus leniter dejecerit. (In simple constipation of the old or debilitated.)

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* ℞ Extracti Sennæ fluidi, (page 106) ; Vini Rhei, ā ā, f℥ij. ; Aquæ Cinnamomi, f℥iss. M. Fiat haustus. (A purgative draught, suited for cold leucophlegmatic habits.)

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℞ Mellis Violæ, (page 113) ; Mannæ, ana, ℥ss. ; Syrupi Violæ, q. s. Fiat electuarium, cujus capiat cochleare parvulum pro re natâ. (A mild laxative readily taken by children.)

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℞ Resinæ Scammonii, gr. v. ; Confectionis Amygdalarum, gr. xxx. ; Simul terantur, hisque inter terendum adde, Aquæ destillatæ, f℥iss. M. Fiat haustus. (An excellent cathartic in simple constipation. The dose for children is one-third, or one-half of the above.)

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℞ Pulveris Scammonii, ℥ss. ; Pulveris Jalapæ, ℥j. ; Syrupi Aurantii, q. s. Ut fiant pilulæ xxiv. e quibus sumantur duæ alternis horis vel donec bis dejecerit alvus. (In the constipation of lead colic.)

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℞ Resinæ Jalapæ ; Calomelanos ; Saponis Hispanici, ana, gr. xv. ; Olei Caryophylli, min. vj. M. Divide in pilulas xij. e quibus sumatur una semihorio ad plenam alvi solutionem. (In obstinate constipation.)

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* ℞ Sodæ Hyposulphitis, (page 107), ℥vj. ; Aquæ Menthæ piperitæ, f℥xiv. ; Tincturæ Cardamomi compositæ, f℥ij. M. Fiat haustus. (An active cathartic draught in the constipation of atonic dyspepsia.)

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℞ Sodæ Sulphatis, ℥v. ; Infusi Rosæ acidi, f℥iss. ; Acidi Sulphurici diluti, min. ij. M. Fiat haustus. (A useful antiphlogistic cathartic.)

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℞ Sodæ Phosphatis, ℥iv. ; Aquæ Menthæ Piperitæ, f℥iij. ; Solve, dein adde, Extracti Sennæ fluidi, f℥ss. Fiat mistura, de quâ capiat cochleare amplum secundis horis donec alvus commodè moveatur. (A useful purgative mixture in the mild febrile affections of children.)

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℞ Olei Terebinthinæ ; Olei Ricini, ana, f℥iij. ; Decocti Hordei, f℥vj. M. Fiat enema. (The best purgative in *purpura hæmorrhagica* occurring in children ; it may be administered twice daily until the spots begin to fade.)

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## CAUSTICS.

℞ Chloridi Zinci, ℥ss. ; Muriatis Antimonii, min. xv. ; Farinæ, ℥i. ; Aquæ destillatæ, q. s. Fiat massa, quâ pars morbida exedatur. (An excellent caustic paste in cancer, and in lupus.)

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℞ Chloridi Zinci, ℥ss. ; Farinæ, ℥j. *vel*, ℥ij. *vel*, ℥iij. M. Fiat massa. (The above proportions of flour may be used according to the strength the caustic paste is wished to be ; it is employed in the same cases as the former.)

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℞ Arsenici Albi, partes vj.; Calomelanos, partes xcvj. M. Fiat pulvis Dupuytren. (Sprinkled on lint, and applied in small portions at a time to open cancer; the practice is not unattended with danger.)

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* ℞ Hydrargyri Nitratis Acidi, f℥ij.; Pulveris Tragacanthæ, quantum sufficit ut fiat massa. (A caustic paste for cancer or lupus.)

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℞ Hydrargyri Oxydi nitrici; Aluminis siccati, ana, ℥i. M. Fiat pulvis. (Sprinkled on the parts to repress exuberant and spongy granulations.)

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℞ Hydrargyri Oxydi Nitrici; Amyli, ana, ℥ss.; Sacchari Puri, ʒi. Misce benè terendo simul, ut fiat pulvis subtilissimus. (In thickening of the cornea, to be blown into the eye three or four times a day.)

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℞ Carbonatis Cupri, (page 109), ℥ij.; Adipis preparatæ, ʒi. M. Fiat unguentum. Devergie. (In the chronic forms of eczema and impetigo of the scalp, where stimulating applications are admissible.)

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## DIAPHORETICS.

℞ Antimonii Oxydi Nitromuriatici, ℥iss.; Muriatis Morphiæ, gr. iss.; Conservæ Rosæ q. s. Fiant pilulæ xxiv. e quibus sumantur duæ, tertiis horis. (In chronic cutaneous diseases, and in chronic rheumatism.)

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℞ Pulveris Antimonialis, gr. iij.; Calomelanos, gr. ss.; Extracti Hyoscyami, gr. iss. M. Fiat pilula, sumenda quâque tertiâ horâ. (In acute rheumatism, and in mild febrile affections with a harsh dry skin.)

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℞ Antimonii Tartarizati, gr. ij.; Decocti Dulcamaræ, f℥vij.; Syrupi Hemidesmi, (page 180), f℥i. M. Fiat mistura, de quâ capiat cochleare amplum secundis horis. (An excellent diaphoretic mixture in febrile and inflammatory affections.)

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℞ Tincturæ Guaiaci Ammoniatæ, f℥ij.; Mucilaginis Gummi Tragacanthæ, f℥vj.; Tere simul, et paulatim adjice, Misturæ Amygdalarum, f℥ij. Fiat mistura, sumenda in die partitis vicibus. (In atonic gout, in chronic rheumatism, and in chronic cutaneous diseases.)

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℞ Sarsaparillæ Radicis, incisæ, ʒiss.; Aquæ Destillatæ ferventis, Oj. Macera per horas duodecim in vase clauso, subinde agitans, dein cola.

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℞ Hujus Infusi, f℥x.; Infusi Sassafras, (page 140); Decocti Mezerei, ana, f℥i.; Syrupi Hemidesmi, (page 180), f℥ij. M. Fiat Mistura, de quâ sumatur cyathum vinarium ter quaterve in die. (In secondary syphilitic affections, particularly the forms of cutaneous disease.)

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* ℞ Resinæ Guaiaci, gr. xij.; Olei Sassafras, min. v.; Theriacæ, quantum sufficit ut fiat bolus, ter quaterve indie sumendus. (In chronic rheumatic affections, more especially if of syphilitic origin).

## DIURETICS.

℞ Decocti Chimaphilæ, f℥vij.; Nitratis Potassæ, ℥ss.; Spiritus Ætherei Nitrosi, f℥ss.; Spiritus Juniperi compositi, f℥iij. M. Fiat mistura; Capiat cochleare amplum quâque tertiâ horâ. (A stimulating diuretic in old cases of dropsy.)

* ℞ Tincturæ Buchu, f℥ss.; Decocti Uvæ Ursi, f℥viiss. M. Fiat mistura, cujus capiat unciam, quater in die. (In chronic catarrh of the bladder, and in chronic mucous discharges from the vagina or urethra.)

℞ Extracti Pareiræ, ℥i.; Carbonatis Sodæ siccati, gr. xij.; Extracti Conii, gr, vj.; Syrupi Papaveris, q. s. ut fiant pilulæ xxiv.; Capiat ij. sextâ quâque horâ. (In calculous affections, and in chronic catarrh of the bladder.)

℞ Bitartratis Potassæ, ʒss.; Ureæ, ℥ij.; Mellis, ʒss. M. Fiat electuarium, de quo capiat instar nucis moschatæ, ter quotidie. (In anasarca or ascites, with deficient secretion of urine.)

℞ Pulveris Scillæ, gr. xxx.; Potassæ Acetatis, ʒss.; Oxymellis Scillæ, f℥ij.; Mellis, ʒss.; Olei Juniperi, min. xx. M. Fiat electuarium, de quo capiat instar nucis moschatæ sextis horis. (In old cases of anasarca.)

℞ Amygdalarum Dulcium decorticatarum, ʒj.; Cantharidum, in pulvere subtilo, gr. x.; Sacchari Puri, ʒss.; Tere bene simul, et gradatim adjice, Aquæ tepidæ, f℥x. Cola. Liquoris colatæ capiat cochleare amplum tertiis horis. (In torpor of the kidneys, and in incontinence of urine caused by paralysis of the neck of the bladder.)

* ℞ Boracis, gr. xxx.; Decocti Pareiræ, (page 149), f℥xij. M. Fiat mistura, de quâ sumatur cyathum vinarium sextis horis. (In chronic mucous discharges from the bladder with excess of uric acid.

℞ Olei Terebinthinæ, f℥i.; Gummi Tragacanthæ, ℥ss.; Syrupi Aurantii, f℥i.; Tere bene simul, et gradatim adjice, Aquæ Menthæ Piperitæ, f℥vj.; Spiritus Ætherei Nitrosi, f℥ij. M. Capiat cochleare amplum, quâque secundâ horâ. (A stimulating diuretic.)

## EMETICS.

℞ Ammoniæ Carbonatis, gr. xxx.; Infusi Senegæ, f℥i.; Syrupi Croci, f℥ij. M. Fiat haustus statim sumendus. (In the suffocative catarrh of typhus).

℞ Emetinæ Impuræ, gr. ij.; Syrupi Aurantii florum, f℥i.; Aquæ destillatæ, f℥ij. M. Capiat cochleare amplum semihorio, donec supervenerit vomitio. (A certain emetic, applicable to the same cases as Ipecacuanha.)

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℞ Violæ Odoratæ Radicis, ℥ss.; Syrupi Scillæ, f℥i. M. Fiat bolus statim sumendus, et post horam repetendus si opus sit. (An excellent substitute for Ipecacuanha.)

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℞ Sinapis, ℥i.; Aquæ tepidæ, f℥xij. M. Fiat mistura statim sumenda. (An excellent stimulating emetic, particularly useful when the vital powers are sinking).

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## EMMENAGOGUES.

* Ergotinæ, (page 165), gr. xij.; Syrupi Croci, f℥ss.; Aquæ Menthæ piperitæ, f℥iiiss. M. Fiat mistura cujus capiat cochlearia ampla duo quartâ parte horæ ad effectum. (To accelerate delivery.)

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℞ Tincturæ Ergotæ, (page 166), f℥iss.; Syrupi Croci, f℥ij.; Decocti Aloës compositi, f℥vj. M. Fiat mistura, cujus capiat cochlearia ampla ij. sextis horis. (In amenorrhœa, with torpor of the circulation.)

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℞ Tincturæ Ergotæ Æthereæ, (page 166), f℥i.; Infusi Sabinæ, (page 167), f℥iiiss.; Syrupi Croci, f℥ss. M. Fiat mistura, de quâ sumatur cochleare magnum ter in die. (In chlorotic amenorrhœa after the use of ferruginous preparations for some time.)

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℞ Sulphatis Ferri siccati, gr. xx.; Pilulæ Aloës cum Myrrhâ, ℥i.; Olei Rutæ, min. vj. M. Fiat massula et divide in pilulas xxiv. e quibus sumantur ij. bis quotidie. (Useful in chlorosis.)

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℞ Rubiæ Tinctorum, ℥i.; Theriacæ, q. s.; Olei Sabinæ, min. xij. M. Fiat electuarium cujus capiat sextam partem ter de die. (In simple atony of the uterine organs.)

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## EMOLLIENTS.

℞ Olei Olivæ, f℥ij.; Vitelli Ovi unius; Syrupi Althææ, f℥i.; Infusi Lini Compositi, f℥iij. Fiat mistura secundum artem; Capiat æger cochleare amplum subinde. (In inflammatory affections of the kidneys, in ardor urinæ, and as a general demulcent.)

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℞ Decocti Hordei compositi, f℥x.; Syrupi Hemidesmi, (page 180), f℥ij. M. Fiat mistura, cujus sumatur cochlearia ampla duo interdum. (An agreeable demulcent and emollient mixture, useful in inflammations of the mucous membranes.)

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℞ Decocti Tussilaginis, (page 189) ; Misturæ Amygdalarum, ana, f℥iij. ; Syrupi Hemidesmi, f℥ij. M. Fiat mistura, de quâ capiat cochlearia ampla duo horis intermidiis. (A useful demulcent mixture in chronic bronchitis.)

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℞ Decocti Althææ, f℥vi. ; Decocti Glycirrhizæ, f℥i. ; Tincturæ Opii camphoratæ, f℥ij. ; Syrupi Hemidesmi, f℥i. M. Fiat mistura, capiat cochleare amplum tussi urgente. (In the troublesome cough of phthisis, and of chronic bronchitis).

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## EPISPASTICS.

℞ Cantharidum, in crasso pulvere, ℥iv. ; Acidi Pyrolygnei concentrati, f℥ij.; Spiritus Vini rectificati, Oj. Digere in vase vitreo clauso per dies tres, dein exprime et cola ; Tinctura destillat calore gradûs 160 F. ad idoneam spissitudinem. (By this process a syrupy-looking extract is obtained, which, spread thinly on paper and applied to the skin, vesicates rapidly and freely.)

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℞ Terebinthinæ Vulgaris ; Mastiche, ana, partes sex ; Cantharidum, in pulvere, partes duas ; Euphorbiæ Pulveris, partem unam, M. (For a perpetual blister, or to act as a powerful counter-irritant.)

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℞ Euphorbiæ, in pulvere subtilo, gr. xxx. ; Adipis præparati, ℥j. M. Fiat unguentum. (An excellent issue ointment, see page 197.)

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℞ Olei Terebinthinæ, f℥j. ; Vitelli Ovi unius ; Tincturæ Capsici, f℥iss. ; Cetacei, ℥ss. ; Tere bene, et adde inter terendum, Olei Olivæ, f℥iij. Fiat linimentum. (An excellent rubefacient liniment.)

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℞ Linimenti Ipecacuanhæ, (page 197) ; Linimenti Ammoniæ, ana, p. æ. M. Fiat linimentum. (An excellent counter-irritant applied with friction.)

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## EXPECTORANTS.

℞ Syrupi Hemidesmi, f℥iv. ; Tincturæ Balsami Tolutani, f℥ss. ; Tincturæ Opii Camphoratæ, f℥j. ; Vini Ipecacuanhæ, f℥iij. ; Aquæ destillatæ, f℥iij. M. Fiat syrupus expectorans, cujus sumat cochleare amplum quâque secundâ horâ. (In chronic bronchitis.)

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℞ Vini Ipecacuanhæ, f℥iij. ; Syrupi Tolutani, f℥v. ; Mucilaginis Acaciæ, f℥j. M. Fiat Mistura, capiat cochleare parvum omni horâ vel quâque secundâ horâ. Cheyne. (For children threatened with an attack of croup or bronchitis.)

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℞ Antimonii et Potassæ Tartratis, gr. ij. ; Aquæ destillatæ, f℥vij. ; Aquæ Lauro-cerasi, f℥ij. ; Syrupi Simplicis, f℥vj. M. Fiat mistura, de quâ sumatur cochleare amplum bihorio. (In acute attacks of catarrh and bronchitis, combined with general antiphlogistic treatment.)

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℞ Pulveris Senegæ, gr. xxx. ; Carbonatis Sodæ siccati, gr. vj. ; Pulveris Scillæ, gr. j. ; Sacchari Puri, gr. xij. M. Divide in pulveres sex, Capiat unum quartâ quâque horâ. (In the advanced stages of hooping cough and bronchitis in children.)

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℞ Tincturæ Lobeliæ Æthereæ, (page 208), f℥ij. ; Misturæ Amygdalarum, f℥viss. ; Succi Conii, (page 261), f℥ij. ; Syrupi Hemidesmi, f℥j. M. Fiat mistura, cujus capiat cochleare amplum tertiis horis. (An excellent mixture in asthma and in paroxysmal coughs.)

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℞ Pilulæ Ipecacuanhæ compositæ, ℥j. ; Styracis Colati, ℥ss. ; Pulveris Lobeliæ, gr. xij. M. Divide in pilulas viginti quatuor, e quibus sumantur duæ sextis horis. (In old cases of bronchitis and in humoral asthma.)

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## NARCOTICS.

℞ Succi Belladonnæ, (page 215), f℥iv. ; Misturæ Camphoræ, f℥vij. ; Syrupi Rhœados, f℥ss. M. Fiat mistura, cujus capiat cochleare amplum sextis horis. (An excellent anodyne in neuralgia and tic douloureux.)

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℞ Tincturæ Belladonnæ, (page 215), f℥ij. ; Linimenti Saponis cum Opio, f℥viij. M. Fiat linimentum anodynum, sæpe utendum. (In neuralgic pains and painful glandular enlargements.)

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℞ Unguenti Belladonnæ, ℥ij. ; Camphoræ, rasæ et redactæ, ℥i. ; Tincturæ Opii Camphoratæ, f℥i. M. Fiat unguentum. (An excellent application to painful hemorrhoids, and along the urethra in chordee.)

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℞ Tincturæ Cannabis, (page 217), f℥i. ; Mucilaginis Gummi Arabici, f℥ij. ; Aquæ Cinnamomi, f℥iss. M. Fiat haustus, statim sumendus et repetatur secundis horis vel sæpiùs si minetur morbus. (In tetanus, or hydrophobia ; half the above quantity may be taken every five or six hours in sciatica and other neuralgic pains.)

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℞ Succi Hyoscyami, (page 219), f℥ss. ; Misturæ Camphoræ, f℥j. ; Syrupi Rhœados, f℥ij. M. Fiat haustus horâ somni sumendus, et repetatur alternâ horâ si non dormiat. (An excellent narcotic draught in cases where from any cause opium is inadmissible.)

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* ℞ Olei Hyoscyami, (page 219), min. xl. ad f℥ij.; Cataplasmatis Lini, quantum sufficit, ut cataplasma idoneæ magnitudinis fiat. (An admirable poultice in painful glandular enlargements.)

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℞ Tincturæ Lactucarii, f℥i.; Aquæ Destillatæ, f℥i.; Aquæ Lauro-cerasi, min. xx.; Syrupi Simplicis, f℥ii. M. Fiat haustus manè et serò sumendus. (An excellent anodyne draught in phthisis.)

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℞ Lupulinæ, gr. viij.; Mucilaginis, q. s. Fiant pilulæ duæ, horâ decubitûs sumendæ. (A doubtful narcotic, used sometimes in the restlessness and watchfulness of mania and other nervous affections.)

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℞ Morphiæ Sulphatis, (page 226), gr. ¼.; Extracti Glycirrhizæ, gr. ij. M. Fiat pilula, horâ somni sumat. (For relieving pain and procuring rest.)

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℞ Muriatis Morphiæ Solutionis, (Ed. Phar.), min. xxx.; Aquæ Florum Aurantii, f℥i.; Syrupi Aurantii, f℥ss. M. Fiat haustus pacificus, horâ somni sumendus. (An excellent anodyne draught.)

---

℞ Morphiæ Sulphatis, (page 226), gr. ss.; Acidi Sulphurici diluti, min. ij.; Aquæ Destillatæ, f℥ij.; Syrupi Limonum, f℥ss. M. Fiat solutio, duabus vicibus sumenda. (An excellent anodyne where night-watchings are troublesome.)

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℞ Pilulæ Saponis cum Opio, gr. xx.; Camphoræ, rasæ et redactæ, ℥ss.; Mucilaginis, q. s. M. Divide in pilulas xij., capiat unam quâque sextâ horâ. (In priapism and irritation of the neck of the bladder.)

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* ℞ Liquoris Opii Sedativi, (page 236), min. xx.; Syrupi Papaveris Rhœadis, f℥ij.; Misturæ Camphoræ, f℥i. M. Fiat haustus. (A useful anodyne draught in febrile and inflammatory affections.)

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℞ Tincturæ Stramonii, (page 239), min. xv.; Aquæ Destillatæ, f℥i.; Syrupi Limonum, f℥ss. M. Fiat haustus tertiis horis repetendus, donec dolor mitescat. (Exceedingly useful in tic douloureux, sciatica, and all forms of chronic disease attended with acute pain.)

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℞ Extracti Stramonii, gr. ij.; Extracti Hyoscyami, gr. vj.; Extracti Humuli, ℥ss. M. Divide in pilulas duodecim, quarum capiat unam quartâ quâque horâ dolorem lenire. (In painful nervous affections, and in all forms of chronic disease attended with acute pain.)

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* ℞ Tincturæ Toxicodendri, (page 240), f℥ss.; Syrupi Papaveris, f℥j.; Syrupi Limonum, f℥ss.; Aquæ, f℥iss.; M. Fiat haustus. Capiat unum talem sextis horis. (In the acute pains which so frequently attend on chronic paralysis.)

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## REFRIGERANTS.

℞ Acetosellæ, ℥j.; Aquæ ferventis, f℥viij; Infunde per horam in vase clauso, exprime et cola, dein adde Syrupi Mori, f℥ij. Fiat mistura, de quâ sumatur cochlearia ampla duo subinde. (An agreeable refrigerant in febrile and inflammatory disorders.)

---

* ℞ Acidi Oxalici, gr. v.; Syrupi Limonum, f℥ss.; Aquæ destillatæ, f℥viiss; M. Fiat Mistura, cujus capiat cochlearia ampla duo tertiis horis. (In inflammation of the stomach.)

---

℞ Succi spissati Sambuci, ℥ss.; Aquæ destillatæ, f℥viiss.; Tere simul ut fiat solutio, dein adde, Nitratis Potassæ, ʒss.; et solve. Capiat cochleare amplum bihorio. (A useful refrigerant in hemoptysis with active inflammation.)

---

℞ Syrupi Aceti, f℥ij.; Aquæ Destillatæ, f℥viij. M. Fiat mistura, capiat cochleare amplum subinde. (To allay thirst in febrile affections.)

---

℞ Nitratis Potassæ, gr. xv.; Aquæ Destillatæ, f℥iss.; Syrupi Limonum, f℥ij. M. Fiat haustus, ter in die sumendus. (In active hemorrhages.)

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℞ Sodæ Bicarbonatis, ℈i.; Aquæ, f℥iss.; Syrupi Simplicis, f℥ij. M. Fiat haustus in effervescentiâ cum succi Limonum recentis cochleari magno, subinde sumendus. (To allay thirst in febrile and inflammatory disorders.)

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## SEDATIVES OR CONTRA-STIMULANTS.

℞ Acidi Hydrocyanici, min. j.; Aquæ Destillatæ, f℥vij.; Syrupi Simplicis, f℥i. M Fiat haustus quâque secundâ horâ sumendus donec evanescant symptomata. (In gastric irritability, in nervous palpitations, in angina pectoris, &c.)

---

℞ Tincturæ Aconiti, (page 254), min. v.; Misturæ Camphoræ, f℥i. M. Fiat haustus, sextis horis sumendus donec dolor mitescat. (Most useful in acute rheumatism and in neuralgia; its effects should be carefully watched.)

---

℞ Tincturæ Aconiti, (page 254); Succi Conii, (page 261), ana, f℥ss. M. Sit pro lotione. (Exceedingly useful applied over the seat of the pain in tic douloureux.)

---

℞ Extracti Alcoholici Aconiti, (page 254), gr. iss.; Myristicæ Adipis, gr. xviij.; Mucilaginis, q. s., ut fiat massula. Divide in pilulas sex, quarum sumatur una sextis horis. (In chronic rheumatism and other painful affections.)

---

* ℞ Carbonis Chloridi, (page 258), min. v.; Syrupi Papaveris Rhœadis, f℥j.; Aquæ destillatæ, f℥i.; M. Fiat haustus, urgenti dolore sumendus. (A sedative draught in cancerous and spasmodic diseases.)

---

* ℞ Carbonis Chloridi, min. xx.; Pulveris pro cataplasmate, ℥vi.; Aquæ ferventis, q. s. Fiat cataplasma. (An anodyne poultice for cancerous and other painful ulcerations.)

---

℞ Succi Conii, (page 261), f℥vj.; Syrupi Aurantii, f℥x.; Aquæ Cinnamomi, f℥vj. M. Fiat mistura, cujus capiat cochleare amplum ter de die. (In chronic rheumatism, in neuralgia, and in painful spasmodic diseases.)

---

℞ Creasoti, min. ij.; Mucilaginis Gummi Arabici, f℥ij.; Aquæ Destillatæ, f℥j.; Spiritus Myristicæ, f℥ss. M. Fiat haustus quâque secundâ horâ sumendus, donec sedantur vomitiones. (In obstinate vomitings.)

---

℞ Succi Digitalis, (page 264), min. xij.; Misturæ Camphoræ, f℥j.; Syrupi Aurantii, f℥ij.; Acidi Hydrocyanici, min. j. M. Fiat haustus, bis terve in die sumendus. (An excellent remedy in nervous palpitations.)

---

* ℞ Naphthæ medicinalis, (page 265), min. x.; Syrupi Aceti, f℥ij.; Aquæ, f℥j. M. Fiat haustus, capiat unum talem sextis horis. (A useful anodyne in the hectic of phthisis.)

---

℞ Cyanidi Potassii, gr. j.; Aquæ Destillatæ, f℥iiiss.; Syrupi Limonum, f℥ss. M. Divide in haustus octo, sumatur unus pro dosi, Donovan. (Used as a substitute for hydrocyanic acid.)

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## GENERAL STIMULANTS.

* ℞ Ætheris Acetici, (page 273), min. xxx.; Misturæ Camphoræ cum Magnesiâ, f℥j. M. Fiat haustus statim sumendus, et si opus sit post horam repetatur. (In hysteria.)

---

℞ Ætheris Sulphurici, f℥j.; Cetacei, gr. ij.; Tere simul et gradatim adde Aquæ Menthæ Piperitæ, f℥j. Fiat haustus. (In nervous headache, spasmodic colic, fainting, &c.)

---

℞ Spiritus Ætheris Sulphurici, f℥j.; Misturæ Camphoræ, f℥j.; Tincturæ Cardamomi compositæ, f℥ij. M. Fiat haustus statim sumendus, et repetatur bihorio molestante flatulentiâ. (In flatulent colic.)

---

℞ Spiritus Ætheris Sulphurici compositi, f℥ss.; Tincturæ Opii, min. x.; Misturæ Camphoræ, f℥j.; Spiritus Anisi compositi, f℥j. M. Fiat haustus sextis horis sumendus. (A useful stimulant in the low stages of fever.)

---

℞ Carbonatis Ammoniæ, gr. v.; Misturæ Camphoræ, f℥j.; Infusi Arnicæ, (page 286); Spiritus Armoraciæ compositi, ana, f℥ij. M. Fiat haustus, quâque secundâ horâ sumendus. (In adynamic febrile affections.)

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* ℞ Ammoniæ Muriatis, ℥i.; Syrupi Hemidesmi, f℥ss.; Aquæ Cinnamomi, f℥viiss. M. Fiat mistura cujus capiat cochlearia ampla duo sextis horis. (A useful mixture in adynamic fevers and subacute laryngitis.)

---

℞ Olei Cajuputi, min. v.; Mucilaginis Tragacanthæ, f℥j.; Tere simul et adde, Infusi Caryophyllorum, f℥iss.; Tincturæ Ammoniæ compositæ, min. vj. M. Fiat haustus. (In hysterical and nervous affections.)

---

℞ Spiritus Ætheris Sulphurici, f℥j.; Solutionis Muriatis Morphiæ, min. xv.; Aquæ Menthæ Piperitæ, f℥j. M. Fiat haustus statim sumendus, et repetatur, si opus sit, quartâ parte horæ. (A powerfnl stimulating antispasmodic; very useful in spasm of the stomach and in spasmodic colic.

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* ℞ Tincturæ Arnicæ, (page 286), f℥ss.; Infusi Acori, (page 287), f℥viiss. M. Fiat mistura, cujus capiat unciam tertiis vel quartis horis. (In nervous head-ache and in old paralytic cases.)

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℞ Calcis Chlorinatæ, ℥ij.; Aquæ Destillatæ, Oj.; Solve et cola, dein adde, Mellis despumati, ℥j. Fiat gargarismus sæpè utendus, priùs phiala concussa. (An exceedingly useful gargle in excessive mercurial salivation.)

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℞ Calcis Chlorinatæ, ℥j.; Aquæ Destillatæ, f℥x.; Solve et cola, dein adde, Acidi Prussici, f℥j. Fiat lotio; Signetur, Poison. (An excellent application in chronic cutaneous diseases, when itching and tingling are very troublesome.)

---

℞ Camphoræ, rasæ et redactæ, ℥ij.; Mucilaginis Gummi Arabici, f℥j.; Aquæ Destillatæ, f℥vij. M. Fiat mistura, de quâ sumatur cochleare amplum quartis horis. (In cases of chronic bronchitis in the old and debilitated.)

---

℞ Camphoræ rasæ et redactæ, ℥ij.; Lactis recentis, f℥vj.; Aquæ Menthæ Pulegii, f℥ij. M. Fiat mistura, cujus capiat cochleare amplum quartâ quâque horâ. (In the same case as the above.)

---

℞ Camphoræ rasæ et redactæ, gr. xij.; Carbonatis Ammoniæ, gr. ix.; Extracti Hyoscyami, gr. vj.; Mucilaginis, q. s. Fiat massula et divide in pilulas sex, quarum sumatur una bihorio. (In the advanced stages of typhoid and nervous fevers.)

---

℞ Cerevisiæ Fermenti; Misturæ Camphoræ, ana, f℥vj.; Tincturæ Arnicæ, (page 286), f℥ij. M. Fiat mistura, de quâ sumantur cochlearia tria ampla tertiis horis. (An excellent stimulant in the advanced stages of fevers when nervous symptoms predominate.)

---

℞ Muriatis Ammoniæ, ℈j.; Pulveris Aromatici, gr. vj.; Theriacæ, q. s. ut fiat bolus. Capiat unum talem sextâ quâque horâ. (For uses, see page 281.)

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℞ Potassii Sulphureti, gr. xl.; Aquæ Destillatæ, f℥vj.; Syrupi Hemidesmi, f℥ij. M. Fiat mistura, cujus capiat cochleare amplum ter quaterve in die. (In rebellious cutaneous diseases.)

---

℞ Tincturæ Sabadillæ, (page 317), f℥i.; Tincturæ Camphoræ, f℥ii.; Spiritus Rosmarini, f℥ss. M. Fiat embrocatio, cum panno laneo partibus dolentis applicanda. (In neuralgia and in muscular pains.)

---

℞ Liquoris Sodæ Chlorinatæ, f℥iiss.; Infusi Serpentariæ, f℥vj.; Syrupi Aurantii, f℥iss. M. Fiat mistura; Capiat cochlearia ampla duo quartis horis. (In the advanced stages of typhoid fever.)

---

℞ Olei Terebinthinæ, f℥iiss.; Mucilaginis Tragacanthæ, f℥ss.; Infusi Armoraciæ compositi, f℥v. M. Capiat cochleare amplum unum quâque secundâ horâ. (A useful stimulant in adynamic fevers.)

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℞ Olei Terebinthinæ, f℥ss.; Adipis Præparati, ℥iss.; Olei Bergamotæ, min. xij. M. Fiat unguentum, mane nocteque applicandum. (In chronic eczema and impetigo of the scalp.)

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## SPECIAL STIMULANTS.

℞ Arsenici Iodidi, gr. ij.; Mannæ duræ, gr. xl.; Mucilaginis, q. s. M. Fiat massula et divide in pilulas xx. quarum capiat unam ter de die. (In psoriasis and lepra; the dose should be gradually increased, until one-fourth of a grain is taken three times a day.)

---

℞ Auri Iodidi, gr. j.; Pulveris Gummi Arabici, gr. xxx. Misce intimè et divide in partes æquales quindecim, è quibus sumatur una ter in die. (In secondary syphilitic affections; the dose should be gradually increased to one-tenth of a grain.)

---

℞ Auri Chloridi, gr. j.; Extracti Alcoholici Aconiti, (page 254), gr. vj.; Pulveris Glycirrhizæ, ℈ij.; Syrupi, q. s. Misce intimè et divide massulam in pilulas viginti, quarum sumatur una ter in die. (In secondary syphilitic affections attended with much pain.)

---

* ℞ Solutionis Ammoniæ Arseniatis, (page 327), f℥i.; Decocti Ulmi, f℥vij. M. Fiat mistura, cujus capiat cochlearia ampla duo quater in die. (In obstinate cutaneous affections, especially lepra and psoriasis.)

---

℞ Sodii Auro-terchloridi, gr. ij.; Mannæ duræ, gr. l. Tere benè simul, et ope mucilaginis, forma in pilulas viginti quatuor, è quibus sumatur una ter in die. (In syphilitic affections both primary and secondary.)

---

℞ Sodii Auro-terchloridi, gr. iv.; Solve in aquæ destillatæ, q. s.; Extracti Aconiti, ℈ss.; Extracti Dulcamaræ, ℥j.; Althææ Radicis, in pulvere, q. s. M. Divide in pilulas lxxx., quarum capiat unam ter in die; Grötzner. (Said to be very efficacious in venereal skin diseases.)

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℞ Sodii Auro-terchloridi, gr. ij.; Aquæ Destillatæ, f℥j.; Syrupi Simplicis, f℥ij. M. Fiat solutio, de quâ sumantur guttæ duodecim ter in die. (One of the best forms for administering the preparations of gold, as the dose can be apportioned with great accuracy.)

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* ℞ Hydrargyri Bromidi, (page 332), gr. ss.; Infusi Sarsaparillæ, (page 139), f℥viij. M. Fiat mistura, capiat cochlearia duo ampla sextis horis. (In secondary syphilitic affections.

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℞ Copaibæ, f℥iij.; Solutionis Alkalinæ, (Brandish), f℥iss.; Tere benè simul in mortario vitreo, dein adde inter terendum, Olei Limonum, f℥ss.; et Syrupi Simplicis, f℥iii. Fiat mistura, capiat cochleare minimum ter in die ex cyatho aquæ. (This is an excellent form for administering copaiva.)

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* ℞ Hydrargyri Iodidi (flavi), gr. ij.; Hydrargyri cum cretâ, gr. xij.; Pulveris Aromatici, gr. ix. M. Divide in pulveres sex, quorum capiat unum omni mane. (An excellent alterative in the cutaneous eruptions of infancy and childhood. The above proportions are for a child two years old.)

---

℞ Hydrargyri Iodidi rubri, gr. j.; Extracti Gentianæ; Extracti Chamæmeli, ana, ℥ss. M. Divide in pilulas xij. Capiat unam mane nocteque. (Alterative and tonic.)

---

℞ Hydrargyri Iodidi rubri, gr. v.; Spiritus Vini Rectificati, f℥i.; Tere simul dein adde, Aquæ Destillatæ, f℥ij.; Iodidi Potassii, ℥ij.; Syrupi Aurantii, f℥ss. M. Fiat solutio, cujus sumantur min. xx, ter in die. (In secondary syphilitic affections; every twenty-one minims contain a twelfth of a grain of iodide of mercury and two grains of iodide of potassium.)

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℞ Indigo (aquæ guttis nonnullis subacta), ʒij. to ʒss. ; Pulveris Aromatici, gr. xv. to gr. xxx. ; Syrupi Simplicis, fʒss. to fʒi. M. Fiat electuarium sumendum in die in portionibus divisis. (For uses, see page 351.)

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℞ Iodinii, gr. iv. ; Ætheris Sulphurici, fʒi. Solve. Capiat guttas decem ter in die. (Magendie's ethereal tincture of iodine.)

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℞ Potassii Bromidi, gr. xx. ; Aquæ Florum Aurantii, fʒiij. ; Syrupi Aurantii, fʒi. M. Fiat mistura, cujus capiat partem quartam sextâ quâque horâ. (In chronic enlargements of the liver and spleen, and in secondary syphilitic affections.)

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℞ Olei Morrhuæ, fʒiv. ; Aquæ Potassæ Carbonatis, fʒss. ; Olei Limonum, fʒij. ; Aquæ Carui, fʒiiss. ; Spiritus Carui, fʒss. M. Fiat mistura cujus sumantur cochlearia ampla duo ter in die. (In the cases in which cod-liver oil is indicated ; see page 354.)

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℞ Olei Morrhuæ, fʒss. ; Liquoris Potassæ, fʒss. ; Adipis præparati, q. s. M. Fiat unguentum, sæpè utendum. (In scrofulous ulcerations, and in obstinate cutaneous diseases.)

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* ℞ Tincturæ Nucis Vomicæ, fʒij. ; Tincturæ Cinchonæ, fʒvj. ; Infusi Cinchonæ flavæ, *Ed. Ph.*, fʒvij. M. Fiat mistura cujus capiat unciam ter in die. (An excellent mixture in paralysis consequent on fevers and other acute diseases.)

---

℞ Strychniæ, gr. j. ; Acidi Sulphurici diluti, min. ij. ; Spiritus Vini Rectificati, fʒj. ; Aquæ Destillatæ, fʒxj. M. Fiat solutio, cujus capiat cochleare minimum ter in die. (Each fluid-drachm contains a twelfth of a grain of strychnia in the state of sulphate.)

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℞ Strychniæ, gr. j. ; Acidi Acetici, min. iv. ; Spiritus Vini Rectificati, fʒj. M. Fiat solutio, cujus sumantur min. v , ter in die. (Every five minims contain a twelfth of a grain of strychnia in the state of acetate.)

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℞ Strychniæ, ʒss. ; Olei Olivæ, fʒiss. M. (Ten drops to be rubbed over the temples three or four times a day in cases of amaurosis depending on paralysis of the optic nerve.)

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℞ Potassii Bromidi, ʒss. ; Adipis Præparati, ʒi. ; Brominei, min. vj. M. Fiat unguentum. (About the size of a nut of this ointment should be rubbed over chronic glandular enlargements twice daily.)

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## TONICS.

* ℞ Acidi Phosphorici Diluti, fʒss. ; Infusi Calumbæ, *Ed. Ph.*, fʒvij. ; Tincturæ Cardamomi compositæ, fʒss. M. Fiat mistura, cujus capiat unciam ter in die. (In phosphatic deposits from the urine.)

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℞ Argenti Nitratis, gr. ij.; Fellis Bovini inspissati; Extracti Chamæmeli, ana, ʒss. M. Divide in pilulas duodecim, quarum sumatur una mane meridieque. (In chronic affections of the stomach accompanied by much pain, but without organic disease.)

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* ℞ Argenti Chloridi, (page 368), gr. xxxvj.; Muriatis Quinæ, (page 391), gr. xviij.; Mannæ duræ, gr. viij. M. Fiat massula opi mucilaginis, et divide in pilulas duodecim; quarum capiat unam sextis horis. (An excellent tonic in the early stages of tubercular phthisis, and in dyspepsia occurring in debilitated habits.)

---

℞ Argenti Oxydi, gr. vj.; Extracti Artemisiæ Absinthii, ʒj. M. Divide in pilulas xij. e quibus sumatur una ter in die. (In angina pectoris, epilepsy, chorea, &c.)

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℞ Iodinei Liquoris compositi, (E.), fʒss.; Liquoris Arsenicalis, fʒiss. M. Fiat mistura, cujus capiat min v. ter in die e cyatho vinario misturæ sequentis.

℞ Infusi Absinthii, (page 364), fʒvij.; Syrupi Aurantii, fʒj. M. (This combination of iodine and arsenite of potash will be found very effectual in the treatment of chronic cutaneous affections of a scaly character.)

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* ℞ Bebeerinæ Sulphatis, gr. xvi.; Acidi Sulphurici diluti, min. x.; Aquæ destillatæ, fʒiiiss.; Syrupi Florum Aurantii, fʒss.; M. Fiat mistura, cujus capiat cochlearia ampla duo, sextis horis. (In cephalalgia or neuralgic affections assuming a periodic character.)

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℞ Bismuthi Subnitratis, gr. l.; Pilulæ Colocynthidis compositæ, ʒi.; Syrupi Zingiberis, q. s. M. Fiant pilulæ xxiv, quarum capiat duas mane meridieque. (In pyrosis with constipation.)

---

℞ Cetrarici Acidi, (page 380,) gr. xxiv.; Extracti Calumbæ, (page 377), ʒss. M. Divide in pilulas xij. quarum sumatur una quartâ quâque horâ per dies duos, febre aggrediente. (An excellent febrifuge.)

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℞ Tincturæ Chirettæ, (page 381), fʒss.; Liquoris Cinchonæ, (page 390), fʒij.; Infusi Cascarillæ, fʒviss.; Syrupi Aurantii, fʒvj. M. Fiat mistura, cujus capiat cochlearia ampla duo ter in die. (An excellent tonic mixture in convalescence from acute diseases.)

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℞ Quinæ Muriatis, gr. xij.; Acidi Muriatici diluti, min. v.; Aquæ Destillatæ, fʒvij.; Syrupi Florum Aurantii, fʒj. M. Fiat mistura, Capiat cochlearia ampla duo ter in die. (A useful tonic mixture in chronic debility.)

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* ℞ Quinæ *informis*, (page 386), gr. ij.; Acidi Citrici, gr. j.; Syrupi Limonum, fʒj.; Aquæ destillatæ, fʒj. M. Fiat haustus; Capiat unum talem ter in die. (In general debility and in convalescence from acute diseases.)

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* ℞ Quinæ Arseniatis, (page 391), octavam partem grani; Aquæ destillatæ, f℥iss.; Syrupi Florum Aurantii, f℥j. M. Fiat haustus: Capiat æger unum talem, quartis horis per dies duos, febre aggrediente. (In tertian agues, when quina and arsenic separately fail to cure the disease.)

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* ℞ Quinæ Valerianatis, (page 391), gr. vij.; Infusi Cascarillæ, f℥iv. M. Fiat mistura cujus capiat semiunciam sextis horis. (An excellent remedy for hysterical and neuralgic affections occurring in debilitated habits.)

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* ℞ Ferri Redacti, (page 396), gr. xxxvi.; Pilulæ Aloës cum Myrrhâ, ℥i.; Olei Juniperi, min. x. M. Fiat massula et in pilulas viginti quatuor divide: Capiat duas ter de die. (An excellent form for administering iron in chlorotic amenorrhœa.)

---

℞ Ferri Ammonio-tartratis, ℈ij.; Aquæ Destillatæ, f℥vij.; Syrupi Hemidesmi, f℥j. M. Fiat mistura, cujus capiat cochlearia ampla duo ter in die. (A mild chalybeate tonic.)

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* ℞ Ferri Bromidi, (page 399), ℥i.; Syrupi Florum Aurantii, f℥ss.; Aquæ Florum Aurantii, f℥iss. M. Fiat solutio, cujus capiat cochleare minimum sextis horis ex cyatho infusi amari. (In secondary syphilitic diseases attended with debility, in anemic affections, &c.)

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℞ Ferri Carbonatis Saccharati, ℥ss.; Pulveris Myrrhæ, gr. xxiv.; Pulveris Aromatici, ℥ss. M. Divide in partes æquales duodecim, quarum sumatur una ter in die. (An excellent combination in the protracted diarrhœas of infancy and childhood.)

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* ℞ Ferri Ammoniæ Citratis, (page 401), ℥i.; Aquæ Florum Aurantii, f℥viiss.; Syrupi Simplicis, f℥ss. M. Fiat mistura cujus capiat cochleare amplum quartis horis. (An agreeable form for administering a mild preparation of iron.)

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℞ Ferri Iodidi, ℥ss.; Croci, in pulvere, ℥ij.; Sacchari puri, ℈iv. M. Fiant Trochisci, No. 120; sumantur sex usque ad decem quotidie; Pierquin. (An agreeable mode of administering the iodide of iron in amenorrhœa and chlorosis.)

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* ℞ Ferri Phosphatis, (page 408), gr. xxx.; Pulveris Myrrhæ, gr. xij.; Sacchari puri, gr. vi. M. Divide in pulveres sex, quorum sumatur unus mane meridieque. (In scrofulous diseases of the bones in children.)

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* ℞ Ferri Valerianatis, gr. xij.; Olei Sabinæ, min. vi.; Mannæ duræ, quantum sufficit ut fiant pilulæ sex, quarum capiat unam ter in die. (In chorea and other nervous affections occurring in young girls about the age of puberty.)

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℞ Salicin, (page 417), gr. xvj.; Infusi Gentianæ compositi, f℥vij.; Syrupi Hemidesmi, f℥j. M. Capiat cochlearia ampla duo ter in die. (An excellent tonic in convalescence from acute diseases of the digestive organs.)

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℞ Salicin, ℈ij.; Pulveris aromatici, ℥j. M. Divide in partes æquales duodecim, quarum capiat unam quartâ quâque horâ per dies duos, febre aggrediente. (An excellent substitute for disulphate of quina.)

# APPENDIX B.

## POSOLOGICAL TABLE.

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The Doses in this table are those adapted for an adult, but the ordinary proportion, according to the age of the patient, may be regulated by the following rules:—The dose for an adult being 1, suppose ℥i.: under one year it will be from 1-16th to 1-12th, that is from gr. iv. to gr. v.: at two years old, 1-8th or gr. viij.: at three years old, 1-6th or gr. x.. at four years old, 1-4th or gr. xv.: at seven years old, 1-3rd or ʒi.: at fourteen years old, ½ or ℥ss.: at twenty years old 2-3ds or ʒij.: and from twenty to sixty a full dose.

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|---|---|
| Absinthium | ℥ss. to ℥j. |
| Acetum | f℥ij. to f℥ss. |
| ——— Colchici | f℥ss. to f℥ij. |
| ——— Opii | min. viij. to min. xxv. |
| ——— Scillæ | f℥ss. to f℥iss. |
| Acidum Benzoïcum | gr. v. to gr. xxx. |
| ——— Citricum | ʒj. to ℥j. |
| ——— Gallicum | gr. v. to gr. x. |
| ——— Hydrocyanicum | min. j. to min. ij. |
| ——— Muriaticum dilutum, D. | gtt. xx. to gtt. xl. |
| ——— Muriaticum dilutum, L. E. | f℥ss. to f℥j. |
| ——— Nitricum dilutum, D. | gtt. x. to gtt. xxx. |
| ——— Nitricum dilutum, L. E. | f℥ss. to f℥j. |
| ——— Nitro-muriaticum | gtt. x. to gtt. xx. |
| ——— Oxalicum | gr. i. to gr. ij. |
| ——— Phosphoricum dilutum | min. xx. to f℥j. |
| ——— Succinicum | gr. v. to gr. viij. |
| ——— Sulphuricum dilutum | min. x. to min. xxx. |
| ——— Sulphuricum aromaticum | min. x. to min. xx. |
| ——— Tartaricum | gr. x. to ℥ss. |
| Aconiti pulvis | gr. iij. to gr. xij. |
| Æther Aceticus | f℥ss. to f℥ij |
| ——— Nitrosus | min. x. to min. xxx. |
| ——— Sulphuricus | f℥ss. to f℥ij. |
| Allium sativum | ℥ss. to ℥j. |
| Aloë Socotrina vel Indica | gr. iij. to gr. xv. |
| Aloë Hepatica vel Barbadensis | gr. ij. to gr. v. |
| Alumen | gr. x. to ℥ss. |
| Ammoniacum | gr. x. to ℥ss. |
| Ammoniæ aqua | min. x. to min. xxx. |
| ——— arseniatis solutio | f℥i. to f℥iij. |
| ——— bicarbonas | gr. v. to gr. xxv. |

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| Ammoniæ carbonas (Antacid) ... ... | gr. v. to gr. xx. |
| ——— (Emetic) ... ... ... | gr. xxx. to gr. xl. |
| ——— (Stimulant) ... ... | gr. v. to gr. xv. |
| ——— hydrosulphuretum ... ... ... | min. iv. to min. vj. |
| ——— murias ... ... ... | gr. v. to gr. xxx. |
| Anethi fructus ... ... ... ... | gr. x. to ʒj. |
| Angelicæ fructus ... ... ... | ʒss. to ʒj. |
| ——— radix ... ... ... ... | gr. x. to ʒss. |
| Anisi fructus ... ... ... ... | gr. x. to ʒss. |
| Anthemis nobilis ... ... ... ... | ʒss. to ʒij. |
| Antimonii oxydum nitromuriaticum ... ... | gr. iij. to gr. x. |
| Antimonii sulphuretum ... ... ... | gr. x. to ʒij. |
| ——— aureum ... ... | gr. j. to gr. iv. |
| Antimonium tartarizatum (Diaphoretic) ... ... | gr. 1-12th to gr. 1-6th. |
| ——— (Emetic) ... ... | gr. ij. to gr. v. |
| ——— (Expectorant) ... ... | gr. 1-16th to gr. 1-10th. |
| ——— (Sedative) ... | gr. j. to gr. iij. |
| Aqua Ammoniæ acetatis ... ... ... | fʒss. to fʒij. |
| ——— carbonatis ... ... | min. xxx. to min. xl. |
| —— Anethi ... ... ... ... | fʒss. to fʒiij. |
| —— Barytæ muriatis ... ... ... | min. v. to min. x. |
| —— Calcis ... ... ... ... | fʒj. to fʒiv. |
| ——— Composita ... ... ... | fʒij. to fʒiv. |
| ——— Muriatis ... ... ... | min. xxx. to fʒij. |
| —— Carui ... ... ... ... | fʒj. to fʒiv. |
| —— Cassiæ ... .. ... ... | fʒj. to fʒiv. |
| —— Chalybeata ... ... ... | fʒj. to fʒij. |
| —— Chlorinii ... ... ... ... | fʒss. to fʒij. |
| —— Cinnamomi ... ... ... | fʒj. to fʒiv. |
| —— Fœniculi ... ... ... ... | fʒj. to fʒiv. |
| —— Lauro-cerasi ... ... ... | fʒss. to fʒj. |
| —— Magnesiæ bicarbonatis ... ... ... | fʒss. to fʒiss. |
| —— Menthæ piperitæ ... ... ... | fʒj. to fʒij. |
| ——— pulegii ... ... ... | fʒj. to fʒij. |
| ——— viridis ... ... ... | fʒj. to fʒij. |
| —— Picis liquidæ ... ... ... ... | Oj. to Oij. |
| —— Pimentæ ... ... ... | fʒj. to fʒij. |
| —— Potassæ ... ... ... ... | min. x. to min. xl. |
| ——— carbonatis ... ... ... | min. x. to fʒj. |
| ——— effervescens ... ... ... | fʒij. to fʒviij. |
| ——— sulphureti ... ... ... | min. x. to fʒj. |
| —— Sodæ carbonatis ... ... ... | fʒss. to fʒj. |
| ——— effervescens ... ... ... | fʒvj. to fʒviij. |
| Argenti chloridum ... ... ... ... | gr. iij. to gr. v. |
| ——— nitras ... ... ... ... | gr. 1-6th to gr. iij. |
| ——— oxydum ... ... ... ... | gr. ss. to gr. j. |
| Arnicæ radix ... ... ... ... | gr. x. to gr. xx. |
| Arsenicum album ... ... ... ... | gr. 1-16th to gr. 1-8th. |
| Arsenici iodidum ... ... ... | gr. 1-10th to gr. 1-4th. |
| Artemisia santonica ... ... ... ... | gr. xx. to gr. xxx. |
| Assafœtida ... ... ... ... | gr. x. to ʒss. |
| Auri iodidum ... ... ... ... | gr. 1-15th to gr. 1-10th. |
| —— perchloridum ... ... ... | gr. 1-20th to gr. 1-15th. |
| —— peroxydum ... ... ... ... | gr. 1-10th to gr. 1-4th. |

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| Auri pulvis ... ... ... ... | gr. $\frac{1}{4}$th to gr. iij. |
| Balsamum Peruvianum ... ... ... | min. xx. to min. xl. |
| ——— Tolutanum ... ... ... | gr. x. to gr. xxx. |
| Barii bromidum ... ... ... ... | gr. j. to gr. v. |
| Barytæ murias ... ... ... ... | gr. ij. to gr. v. |
| Bebeerinæ sulphas ... ... ... ... | gr. j. to gr. v. |
| Belladonnæ folia ... ... ... | gr. ss. to gr. j. |
| Belladonnæ radix ... ... ... ... | gr. $\frac{1}{4}$th to gr. ss. |
| Bismuthum album ... ... ... | gr. v. to gr. xx. |
| Brominei solutio ... ... ... ... | min. v. to min. vj. |
| Buchu ... ... ... ... | ℈i. to ℥ss. |
| Black Drop ... ... ... ... | min. v. to min. viij. |
| Calamus aromaticus ... ... ... | gr. xx. to ℥j. |
| Calcii bromidum ... ... ... ... | gr. iij. to gr. x. |
| Calomelas (Alterative) ... ... ... | gr. j. to gr. iij. |
| ——— (Antiphlogistic) ... ... ... | gr. iij. to gr. v. |
| ——— (Cathartic) ... ... ... | gr. ij. to gr. vj. |
| Calumba ... ... ... ... ... | gr. x. to ℥ss. |
| Calx chlorinata ... ... ... ... | gr. ij. to gr. v. |
| Cambogia ... ... ... ... ... | gr. ij. to gr. v. |
| Camphora ... ... ... ... | gr. v. to gr. x. |
| Canella ... ... ... ... ... | gr. x. to ℥ss. |
| Cantharis ... ... ... ... | gr. ss. to gr. ij. |
| Capsicum ... ... ... ... ... | gr. ij. to gr. viij. |
| Carbonis chloridum ... ... ... | min. iij. to min. v. |
| Cardamine pratensis ... ... ... ... | ℥ij. to ℥iij. |
| Cardamomi fructus ... ... ... | gr. v. to gr. xx. |
| Carui fructus ... ... ... ... | ℥j. to ℥ij. |
| Caryophylli ... ... ... ... | gr. x. to ℥ss. |
| Cascarilla ... ... ... ... ... | gr. x. to ℈ij. |
| Cassiæ cortex ... ... ... ... | gr. x. to ℥ss. |
| Cassiæ pulpa ... ... ... ... | ℥ss. to ℥iij. |
| Castoreum ... ... ... ... | ℥j. to ℥ij. |
| Catechu ... ... ... ... ... | gr. x. to ℥i. |
| Cerevisiæ fermentum ... ... ... | f℥ij. to f℥iij. |
| Cetraric acid ... ... ... ... | gr. ij. to gr. v. |
| Chiretta ... ... ... ... | gr. x. to gr. xx. |
| Cinchonæ cortex (Antiperiodic) ... ... | ℥j. to ℥ij. |
| ——— (Tonic) ... ... | gr. x. to ℈ij. |
| Cinchonia ... ... ... ... ... | gr. iij. to gr. v. |
| Cinnamomum ... ... ... ... | gr. x. to ℥ss. |
| Colchici cormus ... ... ... .. | gr. ij. to gr. viij. |
| ——— semina ... ... ... | gr. ij. to gr. v. |
| Colocynthis ... ... ... ... | gr. ij. to gr. viij. |
| Confectio aromatica ... ... ... | gr. xx. to ℥i. |
| ——— Aurantii ... ... ... ... | ℥ij. to ℥j. |
| ——— Cassiæ ... ... ... | ℥ij. to ℥j. |
| ——— Opii ... ... ... ... | gr. x. to ℥j. |
| ——— Piperis nigri ... ... ... | ℥j. to ℥ij. |
| ——— Scammonii ... ... ... | ℥ss. to ℥j. |
| ——— Sennæ ... ... ... | ℥ij. to ℥ss. |
| Conii folia ... ... ... ... | gr. v. to gr. x. |

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| Conii fructus ... ... ... ... | gr. iij. to gr. vj. |
| Conserva Aurantii ... ... ... ... | ʒij. to ʒj. |
| ——— Rosæ ... ... ... | ʒj. to ʒij. |
| ——— Rutæ ... ... ... ... | ℈j. to ʒj. |
| Contrajerva ... ... ... ... | ℈j. to ℈ij. |
| Copaiba ... ... ... ... ... | min. x. to fʒj. |
| Coriandri fructus ... ... ... | ʒss. to ʒj. |
| Corrosivus sublimatus ... ... ... | gr. 1-12th to gr. 1-8th. |
| Creasotum ... ... ... ... | min. j. to min. ij. |
| Creta præparata ... ... ... ... | gr. x. to ʒij. |
| Crocus sativus ... ... ... ... | gr. xij. to ʒj. |
| Cubebæ pulvis ... ... ... ... | ℈j. to ʒiij. |
| Cumini fructus ... ... ... ... | gr. x. to ʒss. |
| Cupri sulphas (Astringent and Tonic) ... ... | gr. ss. to gr. iij. |
| ——— (Emetic) ... ... ... | gr. xij. to gr. xv. |
| Cuprum ammoniatum ... ... ... | gr. ss. to gr. xv. |
| Cuspariæ cortex ... ... ... | gr. x. to ʒss. |
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| Dauci fructus ... ... ... ... | gr. xx. to ℈ij. |
| Decoctum Aloës compositum ... ... | fʒss. to fʒij. |
| ——— Althææ ... ... ... ... | fʒj. to fʒij. |
| ——— Arctii lappæ ... ... ... | fʒiv. to fʒvj. |
| ——— Bistortæ ... ... ... ... | fʒj. to fʒij. |
| ——— Cetrariæ ... ... ... | fʒj. to fʒiv. |
| ——— Cinchonæ ... ... ... | fʒj. to fʒij. |
| ——— Cnici benedicti ... ... | fʒj. to fʒiij. |
| ——— Colocynthidis ... ... ... | fʒij. to fʒss. |
| ——— Dulcamaræ ... ... ... | fʒj. to fʒij. |
| ——— Ergotæ ... ... ... ... | fʒss. to fʒj. |
| ——— Gei ... ... ... ... | fʒss. to fʒj. |
| ——— Geoffroyæ ... ... ... | fʒss. to fʒj. |
| ——— Glycirrhizæ ... ... ... | fʒj. to fʒij. |
| ——— Granati ... ... ... | fʒss. to fʒj. |
| ——— Guaiaci compositum ... ... | fʒij, to fʒiv. |
| ——— Hæmatoxyli ... ... ... | fʒj. to fʒij. |
| ——— Malvæ compositum ... ... | fʒiv. to fʒvj. |
| ——— Mezerei ... ... ... ... | fʒiv. to fʒv. |
| ——— Pareiræ ... ... ... | fʒj. to fʒiij. |
| ——— Pyrolæ ... ... ... ... | fʒj. to fʒij. |
| ——— Quercus ... ... ... | fʒj. to fʒiv. |
| ——— Sambuci ... ... ... | fʒij. to fʒiv. |
| ——— Sarsaparillæ ... ... | fʒiv. to fʒviij. |
| ——— compositum ... | fʒiv. to fʒvj. |
| ——— Senegæ ... ... ... ... | fʒij. to fʒiij. |
| ——— Scoparii ... ... ... | fʒj. to fʒiv. |
| ——— Taraxaci ... ... ... ... | fʒj to fʒij. |
| ——— Tormentillæ ... ... ... | fʒj. to fʒiss. |
| ——— Tussilaginis ... ... ... | fʒij. to fʒiij. |
| ——— Ulmi ... ... ... | fʒiv. to fʒvj. |
| ——— Uvæ-ursi ... ... ... ... | fʒj. to fʒiij. |
| Delphinia ... ... ... ... | gr. 1-12th to gr. 1-4th. |
| Digitaline ... ... .. ... ... | gr. 1-12th to gr. 1-10th. |
| Digitalis (Diuretic) ... ... ... | gr. ss. to gr. j. |
| ——— (Sedative) ... ... ... ... | gr. j. to gr. iij. |

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| Drymis aromatica ... ... ... | ℈i. to ʒj. |
| Elaterina ... ... ... ... ... | gr. 1-20th to gr. 1-10th. |
| Elaterium ... ... ... ... | gr. 1-16th to gr. 1-4th. |
| Electuarium aromaticum ... ... ... | gr. x. to gr. xl. |
| ——— Catechu compositum ... ... | ℈j. to ʒij. |
| ——— Cassiæ ... ... ... ... | ʒij. to ℥j. |
| ——— Opii ... ... ... | gr. x. to ʒj. |
| ——— Scammonii ... ... ... | ℥ss. to ʒj. |
| ——— Sennæ ... ... ... | ʒii. to ℥ss. |
| Emetina, *pure* ... ... ... ... | gr. 1-8th to gr. ss. |
| ———-, *impure* ... ... ... | gr. ss. to gr. iij. |
| Ergota ... ... ... ... ... | ℈j. to ʒj. |
| Ergotin... ... ... ... ... | gr. iss. to gr. iij. |
| Essence of Ginger ... ... ... | min. xx. to min. xl. |
| ——— Pennyroyal ... ... ... | gtt. xx. to gtt. xxx. |
| ——— Peppermint ... ... ... | gtt. xx. to gtt. xxx. |
| ——— Spearmint ... ... ... | gtt. xx. to gtt. xxx. |
| Extractum Aconiti ... ... ... ... | gr. ij. to gr. viij. |
| ——— alcoholicum ... ... | gr. 1-6th to gr. 1-3rd. |
| ——— Aloës ... ... ... | gr. v. to gr. xv. |
| ——— Anthemidis ... ... ... | gr. x. to ℥ss. |
| ——— Artemisiæ absinthii ... ... | gr. x. to gr. xx. |
| ——— Belladonnæ ... ... ... | gr. ss. to gr. iv. |
| ——— Calumbæ ... ... ... | gr. v. to gr. xx. |
| ——— Cannabis ... ... ... | gr. j. to gr. viij. |
| ——— Caryophyllorum ... ... ... | f℥i. to f℥ij. |
| ——— Cinchonæ ... ... ... | gr. v. to gr. xx. |
| ——— Chamæmeli ... ... ... | gr. x. to ʒss. |
| ——— Colchici ... ... ... ... | gr. j. to gr. iij. |
| ——— aceticum ... ... ... | gr. j. to gr. iij. |
| ——— Colocynthidis ... ... ... | gr. v. to ℈j. |
| ——— compositum ... | gr. v. to gr. xv. |
| ——— Conii ... ... ... ... | gr. iij. to gr. v. |
| ——— Digitalis ... ... ... | gr. ss. to gr. j. |
| ——— Fuliginis ... ... ... ... | gr. v. to gr. x. |
| ——— Gentianæ ... ... ... | gr. x. to ʒss. |
| ——— Hæmatoxyli ... ... ... | gr. x. to gr. xxx. |
| ——— Humuli lupuli ... ... ... | gr. v. to gr. xx. |
| ——— Hyoscyami ... ... ... | gr. v. to gr. xv. |
| ——— Jalapæ, D. L. ... ... ... | gr. x. to ℈j. |
| ——— Jalapæ, E. ... ... ... | gr. x. to gr. xv. |
| ——— Krameriæ ... ... ... | gr. xx. to gr. xl. |
| ——— Lactucæ ... ... ... ... | ℈j. to ʒj. |
| ——— Menyanthes ... ... ... | gr. x. to ʒss. |
| ——— Nucis-vomicæ ... ... ... | gr. ss. to gr. iij. |
| ——— Opii ... ... ... ... | gr. ss. to gr. iv. |
| ——— Papaveris... ... ... ... | gr. ij. to gr. xx. |
| ——— Pareiræ ... ... ... | gr. x. to ʒss. |
| ——— Quassiæ ... ... ... ... | gr. v. to gr. xv. |
| ——— Quercus ... ... ... | gr. x. to ʒj. |
| ——— Rhei ... ... ... ... | gr. x to ʒss. |
| ——— Rutæ ... ... ... | gr. x. to gr. xx. |
| ——— Sabadillæ ... ... ... | gr. $\frac{1}{8}$ to gr. $\frac{1}{4}$. |

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| Extractum Sarsaparillæ ... ... ... | ʒss. to ʒij. |
| ——————— fluidum ... ... ... | fʒss. to fʒj. |
| ——— Scammonii ... ... ... | gr. ij. to gr. v. |
| ——— Spartii scoparii ... ... ... | gr. x. to ʒss. |
| ——— Stramonii ... ... ... | gr. ¼ to gr. ss. |
| ——— Taraxaci ... ... ... ... | gr. x. to ʒss. |
| ——— Uvæ ursi ... ... ... | gr. v to gr. xv. |
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| Fel Bovinum inspissatum ... ... ... | gr. v. to gr. x. |
| Ferri acetas ... ... ... ... | min. v. to min. xx. |
| —— ammonio-chloridum ... ... ... | gr. v. to gr. xv. |
| —— ammonio-citras ... ... ... | gr. v. to gr. viij. |
| —— ammonio-tartras ... ... ... | gr. v. to gr. viij. |
| —— bromidum ... ... ... | gr. iij. to gr. viij. |
| —— carbonas saccharatum ... ... ... | gr. v. to gr. xxx. |
| —— citras ... ... ... ... | gr. v. to gr. viij. |
| —— cyanuretum ... ... ... ... | gr. iij. to gr. vj. |
| —— et quinæ citras ... ... ... | gr. iij. to gr. vj. |
| —— iodidum ... ... ... ... | gr. ij. to gr. v. |
| —— lactas ... ... ... ... | gr. vj. to gr. xij. |
| —— limatura ... ... ... ... | gr. x. to ʒss. |
| —— oxydum nigrum ... ... ... | gr. v. to gr. xx. |
| ——————— rubrum ... ... ... | ʒss. to ʒiv. |
| —— pernitras ... ... ... ... | min. xx. to min. xxx. |
| —— phosphas ... ... ... ... | gr. v. to gr. x. |
| —— sulphas ... ... ... ... | gr. j. to gr. v. |
| ——————— exsiccatus ... ... ... | gr. ss. to gr. iij. |
| —— valerianas ... ... ... ... | gr. j. to gr. iij. |
| Ferrum redactum ... ... ... ... | gr. j. to gr. x. |
| ——— tartarizatum ... ... ... | gr. v. to gr. xx. |
| Filix-mas ... ... ... ... ... | ʒj. to ʒiij. |
| Fœniculi fructus ... ... ... | ʒss. to ʒj. |
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| Galbanum ... ... ... ... ... | gr. x to gr. xx. |
| Gentiana ... ... ... ... | gr. x. to gr. xxx. |
| Geoffroyæ cortex ... ... ... ... | gr. xv. to gr. xxx. |
| Geum urbanum ... ... ... ... | ʒss. to ʒj. |
| Gigartina helminthocorton ... ... ... | gr. x. to ʒij. |
| Granatum ... ... ... ... | ʒss. to ʒj. |
| Guaiaci resina ... ... ... ... | gr. x. to ʒss. |
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| Helleborus niger ... ... ... | gr. iij. to gr. xij. |
| Hydrargyri acetas ... ... ... ... | gr. j. to gr. iij. |
| ——————— bicyanidum ... ... ... | gr. 1-12th to gr. 1-8th. |
| ——————— biniodidum ... ... ... | gr. 1-16th to gr. 1-8th. |
| ——————— bromidum ... ... ... | gr. 1-16th to gr. 1-4th. |
| ——————— iodidum ... ... ... | gr. j. to gr. iij. |
| ——————— oxydum rubrum ... ... | gr. ¼ to gr. ss. |
| ——————— sub-bromidum ... ... ... | gr. j. to gr. ij. |
| ——————— sulphuretum nigrum ... ... | gr. v. to ʒss. |
| Hydrargyrum cum cretâ ... ... ... | gr. x. to ʒss. |
| ——————————— magnesiâ .. ... | gr. x. to ʒss. |
| Hyoscyami folia ... ... ... ... | gr. v. to gr. x. |
| ——————— semina ... ... ... | gr. iij. to gr. viij. |

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| Indigo ... ... ... ... ... | gr. v. to gr.x. |
| Infusum Absinthii ... ... ... | ʒj. to ʒij. |
| ——— Allii ... ... ... ... | ʒij. to ʒiij. |
| ——— Anthemidis ... ... ... | ʒj. to ʒij. |
| ——— Armoraciæ compositum ... ... | ʒj. to ʒij. |
| ——— Arnicæ ... ... ... ... | ʒij. to ʒss. |
| ——— Aurantii compositum ... ... ... | ʒj to ʒij. |
| ——— Buchu ... ... ... ... | ʒj. to ʒij. |
| ——— Calami aromatici ... ... ... | ʒj. to ʒij. |
| ——— Calumbæ ... ... ... | ʒj. to ʒiij. |
| ——— Caryophylli ... ... ... ... | ʒj. to ʒij. |
| ——— Cascarillæ ... ... ... | ʒj. to ʒij. |
| ——— Catechu compositum ... ... ... | ʒi. to ʒij. |
| ——— Centaurei ... ... ... | ʒj. to ʒij. |
| ——— Chamæmeli ... ... ... ... | ʒj. to ʒij. |
| ——— Chirettæ ... ... ... | ʒj. to ʒij. |
| ——— Cinchonæ ... ... ... ... | ʒj. to ʒiij. |
| ——— Cnici benedicti ... ... ... | ʒiss. to ʒiij. |
| ——— Cuspariæ ... ... ... ... | ʒj. to ʒij. |
| ——— Digitalis (Diuretic) ... ... | ʒij. to ʒss. |
| ——— ——— (Sedative) ... ... ... | ʒj. to ʒij. |
| ——— Ergotæ ... ... ... | ʒss. to ʒj. |
| ——— Gallæ ... ... ... ... | ʒss. to ʒij. |
| ——— Gentianæ compositum ... ... | ʒj. to ʒij. |
| ——— Gigartinæ ... ... ... ... | ʒij. to ʒss. |
| ——— Granati radicis ... ... ... | ʒss. to ʒiss. |
| ——— Hemidesmi ... ... ... ... | ʒj. to ʒij. |
| ——— Juniperi ... ... ... | ʒiv. to ʒvj. |
| ——— Krameriæ ... ... ... ... | ʒj. to ʒij. |
| ——— Lauri nobilis ... ... ... | ʒss. to ʒij. |
| ——— Lini ... ... ... .. | ʒij. to ʒiv. |
| ——— Lupuli ... ... ... ... | ʒj. to ʒij. |
| ——— Marrubii ... ... ... ... | ʒiij. to ʒiv. |
| ——— Matico ... ... ... ... | ʒj. to ʒij. |
| ——— Melissæ ... ... ... ... | ʒij. to ʒiv. |
| ——— Menthæ simplex ... ... ... | ʒj. to ʒij. |
| ——— ——— compositum ... ... ... | ʒj. to ʒiij. |
| ——— Menyanthis ... ... ... | ʒj. to ʒij. |
| ——— Pareiræ ... ... ... ... | ʒj. to ʒiv. |
| ——— Quassiæ ... ... ... | ʒi. to ʒij. |
| ——— Rhei ... ... ... ... | ʒj. to ʒiv. |
| ——— Rutæ ... ... ... ... | ʒj. to ʒij. |
| ——— Rosæ acidum ... ... ... | ʒj. to ʒij. |
| ——— Sabinæ ... ... ... | ʒss. to ʒj. |
| ——— Sarsaparillæ compositum ... ... | ʒiv. to ʒvj. |
| ——— Sassafras ... ... ... | ʒj. to ʒij. |
| ——— Scoparii ... ... ... ... | ʒj. to ʒij. |
| ——— Senegæ ... ... ... | ʒij. to ʒiij. |
| ——— Sennæ compositum ... ... ... | ʒij. to ʒiv. |
| ——— ——— cum Tamarindis ... ... | ʒij. to ʒiv. |
| ——— Serpentariæ ... ... ... ... | ʒj. to ʒij. |
| ——— Simarubæ ... ... ... | ʒj. to ʒij. |
| ——— Spigeliæ ... ... ... ... | ʒij. to ʒiv. |
| ——— Tanaceti ... ... ... | ʒj. to ʒij. |

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| Infusum Valerianæ ... ... ... ... | fʒj. to fʒij. |
| Inula helenium ... ... ... | ℈j. to ʒij. |
| Ipecacuanha (Emetic) ... ... ... | gr. xij. to gr. xx. |
| ——— (Expectorant) ... ... | gr. ¼ to gr. ij. |
| Jalapa ... ... ... ... ... | gr. x. to gr. xxx. |
| Kino ... ... ... ... ... | gr. x to ʒss. |
| Krameria ... ... ... ... ... | gr. x. to ʒss. |
| Lactucarium ... ... ... ... | gr. v. to gr. xx. |
| Linum catharticum ... ... ... ... | ʒj. to ʒiss. |
| Liquor Ammoniæ ... ... ... | min. x. to min. xxx. |
| ——— sesquicarbonatis ... ... | min. xxx. to min. lx. |
| ——— Arsenicalis ... ... ... | min. v. to min. x. |
| ——— Arsenici et Hydrargyri hydriodatis ... | min. x. to min. xxx |
| ——— Calcis ... ... ... ... | fʒj. to fʒiv. |
| ——— Cinchonæ ... ... ... ... | min. xx. to fʒss. |
| ——— Hydrargyri bichloridi ... ... | fʒss. to fʒij. |
| ——— Iodinei compositus ... ... ... | min. v. to min. xv. |
| ——— Opii sedativus ... ... ... | min. xv. to min. xxx. |
| ——— Potassæ ... ... ... ... | min. x. to min. xl. |
| ——— carbonatis ... ... | min. x. to fʒj. |
| ——— effervescens ... ... ... | fʒij. to fʒviij. |
| ——— Potassii iodidi compositus ... ... | fʒj. to fʒss. |
| ——— Sodæ chlorinatæ ... ... ... | min. xx. to min. xxx. |
| ——— effervescens ... ... | fʒvj. to fʒviij. |
| ——— Taraxaci ... ... ... ... | min. x. to min. xl. |
| ——— Tartari emetici ... ... ... | min. xx. to min. xxx. |
| Lupulina ... ... ... ... ... | gr. vj. to gr. xij. |
| Lythrum salicaria ... ... ... | ʒij. to ʒiv. |
| Magnesia (Antacid) ... ... ... ... | gr. x. to gr. xv. |
| ——— (Cathartic) ... ... ... | ℈j. to ʒj. |
| Magnesiæ carbonas (Antacid) ... ... ... | gr. xv. to ʒss. |
| ——— (Cathartic) ... ... | ʒj. to ʒij. |
| ——— sulphas ... ... ... ... | ʒij. to ʒj. |
| Manganesiæ sulphas ... ... ... | ʒj. to ʒvi. |
| Manna ... ... ... ... ... | ʒj. to ʒij. |
| Mannite ... ... ... ... | ʒss. to ʒj. |
| Matico ... ... ... ... ... | gr. x. to ʒss. |
| Mel Rosæ ... ... ... ... | ʒij. to ʒiv. |
| —— Violæ ... ... ... ... | ʒj. to ʒiv. |
| Menyanthes ... ... ... ... | gr. x. to ʒss. |
| Mistura Althææ ... ... ... ... | fʒj. to fʒij. |
| ——— Ammoniaci ... ... ... | fʒss. to fʒj. |
| ——— Amygdalarum ... ... ... | fʒj. to fʒij. |
| ——— Assafœtidæ ... ... ... | fʒss. to fʒiss. |
| ——— Camphoræ ... ... ... ... | fʒj. to fʒij. |
| ——— cum Magnesiâ ... ... | fʒss. to fʒj. |
| ——— Cascarillæ composita ... ... ... | fʒj. to fʒiss. |
| ——— Creasoti ... ... ... | fʒj. to fʒij. |
| ——— Cretæ ... ... ... ... | fʒj. to fʒij. |
| ——— Ferri composita ... ... ... | fʒj. to fʒij. |

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| Mistura Cretæ ... ... ... ... | fʒj. to fʒij. |
| ——— Ferri composita ... ... ... | fʒj. to fʒij |
| ——————— aromatica ... ... ... | fʒj. to fʒij. |
| ——— Gentianæ composita ... ... | fʒj. to fʒij. |
| ——— Guaiaci ... ... ... ... | fʒss. to fʒij. |
| ——— Monesiæ ... ... ... | fʒss to fʒij. |
| ——— Moschi ... ... ... ... | fʒj. to fʒij. |
| ——— Scammonii ... ... ... | fʒss. to fʒiss. |
| ——— Spiritus Vini Gallici ... ... ... | fʒss. to fʒiss. |
| Monesia ... ... ... ... | gr. v. to gr. xv. |
| Morphia ... ... ... ... ... | gr. ¼ to gr. ss. |
| Morphiæ acetas ... ... ... ... | gr. ¼ to gr. ss. |
| ——— murias ... ... ... ... | gr. ¼ to gr. ss. |
| ——— sulphas ... ... ... | gr. ¼ to gr. ss. |
| Moschus ... ... ... ... ... | gr. x. to gr. xx. |
| Mucuna pruriens ... ... ... | ʒj. to ʒss. |
| Myristica ... ... ... ... ... | gr. x. to gr. xxx. |
| Myrrha ... ... ... ... | gr. x. to gr. xxx. |
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| Naphtha medicinalis ... ... ... ... | min. v. to min. xx. |
| Nux-vomica ... ... ... ... | gr. v. to gr. xx. |
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| Oleum Amygdalæ amaræ ... ... ... | min. ¼ to min. ½. |
| ——— Anethi ... ... ... ... | min. j. to min. v. |
| ——— Anisi ... ... ... ... | min. ij. to min. viij. |
| ——— Anthemidis ... ... ... | min. j. to min. v. |
| ——— Cajuputi ... ... ... ... | min. v. to min. x. |
| ——— Carui ... ... ... ... | min. j. to min. x. |
| ——— Caryophylli ... ... ... ... | min. ij. to min. viij. |
| ——— Cassiæ ... ... ... ... | min. ij. to min. v. |
| ——— Cinnamomi ... ... ... ... | min. j. to min. v. |
| ——— Copaibæ ... ... ... | min. xv. to min. xxx. |
| ——— Crotonis ... ... ... ... | min. j. to min. ij. |
| ——— Cubebæ ... ... ... | min. x. to min. xxx. |
| ——— Euphorbiæ lathyris ... ... ... | min. iv. to min. viij. |
| ——— Filicis maris ... ... ... | min. xx. to min. xxx. |
| ——— Fœniculi ... ... ... ... | min. ij. to min. x. |
| ——— Juniperi ... ... ... | min. v. to min. x. |
| ——— Lavandulæ ... ... ... ... | min. ij. to min. v. |
| ——— Limonum ... ... ... | min. ij. to min. v. |
| ——— Menthæ piperitæ ... ... ... | min. ij. to min. v. |
| ——————— pulegii ... ... ... | min. ij. to min. v. |
| ——————— viridis ... ... ... | min. ij. to min. v. |
| ——— Morrhuæ ... ... ... | fʒss. to fʒj. |
| ——— Myristicæ ... ... ... ... | min. j. to min. v. |
| ——— Olivæ ... ... ... ... | fʒj. to fʒij. |
| ——— Origani ... ... ... ... | min. j. to min. iij. |
| ——— Pimentæ ... ... ... | min. ij. to min. v. |
| ——— Ricini ... ... ... ... | fʒss. to fʒij. |
| ——— Rosmarini ... ... ... | min. ij. to min. v. |
| ——— Rutæ ... ... ... ... | min. ij. to min. v. |
| ——— Sabinæ ... ... ... ... | min. ij. to min. vj. |
| ——— Sassafras ... ... ... ... | min. ij. to min. x. |

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| Oleum Succini ... ... ... ... | min. v. to min. x. |
| ——— Terebinthinæ (Anthelmintic) ... ... | fʒss. to fʒij. |
| ——— (Cathartic) ... ... | fʒij. to fʒij. |
| ——— (Diuretic) ... ... | min. x. to min. xxx. |
| ——— (Stimulant) ... ... | min. x. to min. xx. |
| Olibanum ... ... ... ... | ʒss. to ʒj. |
| Opium ... ... ... ... ... | gr. ss. to gr. iv. |
| Opoponax ... ... ... ... | gr. xx. to gr. xl. |
| Oxymel ... ... ... ... ... | fʒj. to fʒj. |
| ——— Colchici ... ... ... | fʒj. to fʒij. |
| ——— Scillæ (Emetic) ... ... ... | fʒj. to fʒij. |
| ——— (Expectorant) ... ... | min. x. to min. xxx. |
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| Pareira-brava ... ... ... ... | ʒss. to ʒi. |
| Pilulæ Aloës ... ... ... ... | gr. x. to ʒss. |
| ——— compositæ ... ... ... | gr. v. to gr. xv. |
| ——— cum Myrrhâ ... ... | gr. x. to gr. xx. |
| ——— et Assafœtidæ ... ... ... | gr. x. to gr. xv. |
| ——— et Ferri ... ... ... | No. 1 to 3. |
| ——— ante cibum ... ... ... ... | No. 1 to 2. |
| ——— Asiaticæ ... ... ... | No. 1 to 2. |
| ——— Assafœtidæ ... ... ... ... | gr. x. to ℈i. |
| ——— Calomelanos compositæ ... ... | gr. v. to gr. xv. |
| ——— Calomelanos et Opii ... ... ... | No. 1 to 2. |
| ——— Cambogiæ compositæ ... ... | gr. x. to gr. xx. |
| ——— Colocynthidis compositæ ... ... | gr. v. to gr. xv. |
| ——— et Hyoscyami ... ... | No 1 to 3. |
| ——— Conii compositæ ... ... ... | gr. v. to gr. x. |
| ——— Cupri ammoniati ... ... ... | No. 1 to 5. |
| ——— Digitalis et Scillæ ... ... ... | gr. iij. to gr. v. |
| ——— é Styrace ... ... ... | gr. iij. to gr. x. |
| ——— Ferri bromidi .. ... ... | No. 1 to 2. |
| ——— carbonatis ... ... .. | No. 1 to 4. |
| ——— compositæ ... ... ... | gr. x. to gr. xx. |
| ——— iodidi ... ... ... | No. 1 to 3. |
| ——— sulphatis ... ... ... | gr. v. to gr. xv. |
| ——— Galbani compositæ ... ... | gr. x. to ℈i. |
| ——— Gambogiæ et Scammonii ... ... | gr. x. to gr. xx. |
| ——— Hydrargyri (Alterative) ... ... | gr. iij. to gr. v. |
| ——— (Cathartic) ... ... | gr. xij. to gr. xx. |
| ——— Iodidi ... ... | gr. v. to gr. xv. |
| ——— Ipecacuanhæ compositæ ... ... | gr. v. to gr. xx. |
| ——— et Opii ... ... | gr. iv. to gr. viij. |
| ——— Opii *sive* Thebaicæ ... ... ... | No. 1 to 3. |
| ——— Plumbi Opiatæ ... ... ... | gr. viij. to gr. xij. |
| ——— Quinæ ... ... ... ... | No. 2 to 5. |
| ——— Rhei ... ... ... ... | gr. v. to gr. xv. |
| ——— compositæ ... ... ... | gr. v. to ℈i. |
| ——— et Ferri ... ... ... | gr. x. to gr. xv. |
| ——— Sagapeni compositæ ... ... ... | gr. v. to gr. xx. |
| ——— Saponis cum Opio ... ... | gr. iij. to gr. x. |
| ——— Scillæ compositæ ... ... ... | gr. v. to gr. xv. |
| Pimenta ... ... ... ... | ʒss. to ʒj. |

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| Piper longum | gr. v. to ℈j. |
| —— nigrum | gr. v. to gr. xx. |
| Piperin | gr. iij. to gr. v. |
| Plumbi acetas | gr. ij. to gr. viij. |
| ——— iodidum | gr. iij. to gr. v. |
| Polygonum bistorta | ℥ss. to ℥j. |
| Potassæ acetas (Cathartic) | ℥ij. to ℥iij. |
| ——————— (Diuretic) | gr. x. to gr. xx. |
| ——— bicarbonas | gr. x. to gr. xx. |
| ——— bisulphas | ℥ss. to ℥iss. |
| ——— bitartras (Cathartic) | ℥iij. to ℥vj. |
| ——————— (Diuretic) | gr. xx. to ℥j. |
| ——— carbonas | gr. v. to gr. xx. |
| ——— chloras | gr. x. to gr. xx. |
| ——— nitras (Diuretic) | gr. xxx. to gr. xl. |
| ——————— (Refrigerant) | gr. x. to gr. xx. |
| ——— sulphas | ℥j. to ℥iv. |
| ——————— cum sulphure | ℥ss. to ℥j. |
| ——— tartras | ℥ij. to ℥x. |
| Potassii bromidum | gr. iij. to gr. xij. |
| ——— cyanidum | gr. $\frac{1}{8}$ to gr. $\frac{1}{4}$. |
| ——— iodidum | gr. v. to gr. xv. |
| ——— sulphuretum | gr. iij. to gr. x. |
| Pulvis Aloës compositus | gr. x. to ℈j. |
| ——————— cum Canellâ | gr. vj. to gr. xviij. |
| ——— Aluminis compositus | gr. xij. to ℈ij. |
| ——— Antimonialis | gr. iij. to gr. x. |
| ——— Aromaticus | gr. v. to gr. xx. |
| ——— Cinnamomi compositus | gr. v. to gr. xx. |
| ——— Cretæ compositus | gr. x. to gr. xxx. |
| ——————————— cum Opio | gr. xx. to gr. xl. |
| ——— Gallæ | gr. v. to ℈j. |
| ——— Ipecacuanhæ compositus | gr. v. to gr. xx. |
| ——— Jalapæ compositus | ℥ss. to ℥jss. |
| ——— Kino compositus | gr. x. to gr. xxx. |
| ——— Lobeliæ inflatæ | gr. j. to gr. v. |
| ——— Rhei (Stomachic) | gr. v. to gr. x. |
| ——————— (Cathartic) | ℈j. to ℈ij. |
| ——————— compositus | ℥ss. to ℥j. |
| ——— Salinus compositus | ℥ij. to ℥ss. |
| ——— Scammonii compositus | gr. x. to gr. xx. |
| ——— Spongiæ ustæ | ℥j. to ℥iij. |
| ——— Stanni | ʒss. to ʒj. |
| ——— Tragacanthæ | ℥ss. to ℥ij. |
| ——————————— compositus | ℥j. to ℥ij. |
| Punica granatum, radicis cortex | ʒss. to ʒij. |

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| Quassia | gr. xv. to gr. xxx. |
| Quercus cortex | ℥ss. to ℥j. |
| Quina | gr. iij. to gr. v. |
| —— amorphous | gr. iij. to gr. v. |
| Quinæ acetas | gr. j. to gr. v. |
| ——— arsenias | gr. 1-10th to gr. 1-4th. |
| ——— citras | gr. j. to gr. v. |

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| Quinæ disulphas | gr. j. to gr. v. |
| —— murias | gr. j. to gr. v. |
| —— nitras | gr. j. to gr. v. |
| —— phosphas | gr. j. to gr. v. |
| —— tannas | gr. j. to gr. v. |
| —— tartras | gr. j. to gr. v. |
| —— valerianas | gr. j. to gr. iij. |
| Resina Copaibæ | gr. x. to ʒss. |
| —— Jalapæ | gr. iij. to gr. x. |
| —— Scammonii | gr. ij. to gr. v. |
| Rhamni baccæ | No 10 to 20. |
| Rubia tinctorum | ʒss. to ʒii. |
| Sabadillæ pulvis | gr. j. to gr. v. |
| Sabina | gr. v. to gr. xv. |
| Sagapenum | gr. v. to gr. xx. |
| Salicin (Febrifuge) | Ɔj. to Ɔij. |
| —— (Tonic) | gr. ij. to gr. v. |
| Salix | ʒss. to ʒj. |
| Sapo Crotonis | gr. j. to gr. iij. |
| —— Jalapinus | gr. xij. to Ɔj. |
| Sarsaparilla | ʒj. to ʒij. |
| Scammonium | gr. viij. to gr. x. |
| Scilla (Emetic) | gr. viij. to gr. xij. |
| —— (Expectorant) | gr. j. to gr. iss. |
| —— (Diuretic) | gr. j. to gr. iij. |
| Senega | gr. x. to ʒss. |
| Sennæ folia | ʒij. to ℥ss. |
| Serpentaria radix | gr. x. to ℥ss. |
| Sinapis (Emetic) | ℥ss. to ℥j. |
| —— alba | ʒi. to ʒij. |
| Sodæ acetas | gr. x. to gr. xx. |
| —— bicarbonas | gr. x. to ʒss. |
| —— boras | gr. xx. to gr. xxx. |
| —— carbonas | gr. x. to ʒss. |
| —— siccatum | gr. v. to gr. xx. |
| —— et potassæ tartras | ʒij. to ℥j. |
| —— hyposulphis | ʒvj. to ʒj. |
| —— murias | gr. x. to ʒj. |
| —— phosphas | ʒiv. to ʒxij. |
| —— sulphas | ʒv. to ʒx |
| Sodii auro-terchloridum | gr. 1-20th to gr. 1-15th. |
| Solutio alkalina *(Brandish)* | f℥ss. to f℥ij. |
| —— Morphiæ muriatis | min. xx. to min. xl. |
| Spigelia | gr. xx. to gr. xl. |
| Spiritus Ætheris nitrici | f℥ss. to f℥iij. |
| —— sulphurici | f℥j. to f℥iij. |
| —— compositus | f℥ss. to f℥ij. |
| —— Ammoniæ | f℥ss. to f℥iss. |
| —— aromaticus | min. xxx. to f℥i. |
| —— fœtidus | f℥j. to f℥iss. |
| —— Anisi | f℥ss. to f℥j. |

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| Spiritus Anisi compositus ... ... ... | f℥ss. to f℥j. |
| ——— Armoraciæ compositus ... ... | f℥j. to f℥iv. |
| ——— Carui ... ... ... ... | f℥j. to f℥iv. |
| ——— Cassiæ ... ... ... ... | f℥ss. to f℥j. |
| ——— Cinnamomi ... ... ... | f℥j. to f℥ss. |
| ——— Fuliginis ... ... ... ... | min. xx. to min. xxx. |
| ——— Juniperi compositus ... ... | f℥ij. to f℥iv. |
| ——— Lavandulæ compositus ... ... | min. xxx. to f℥ij. |
| ——— Menthæ piperitæ ... ... | f℥ss. to f℥j. |
| ——— pulegii ... ... ... | f℥ss. to f℥j. |
| ——— viridis ... ... ... | f℥ss. to f℥j. |
| ——— Myristicæ ... ... ... ... | f℥j. to f℥iv. |
| ——— Pimentæ ... ... ... | f℥j. to f℥ij. |
| ——— Rosmarini ... ... ... ... | min. x. to min. xxx. |
| Stramonii folia ... ... ... ... | gr. j. to gr. iv. |
| ——— semina ... ... ... ... | gr. ¼ to gr. j. |
| Strychnia ... ... ... ... | gr. 1-12th to gr. 1-8th. |
| Sulphur (Cathartic) ... ... ... | ℥iij. to ℥iv. |
| ——— (Stimulant) ... ... ... | gr. x. to gr. xxx. |
| ——— præcipitatum ... ... ... | ℥iij. to ℥iv. |
| Succus Belladonnæ ... ... ... | min. xx. to min. xl. |
| ——— Colchici ... ... ... ... | min. v. to min. xx. |
| ——— Conii ... ... ... ... | min. xx. to f℥j. |
| ——— Digitalis ... ... ... ... | f℥j. to f℥ij. |
| ——— Hyoscyami ... ... ... | min. xxx. to min. xl. |
| Syrupus Aceti ... ... ... .. | f℥ij. to f℥j. |
| ——— Allii ... ... ... ... | f℥ss. to f℥j. |
| ——— Althææ ... ... ... ... | f℥ss. to f℥j. |
| ——— Aurantii ... ... ... | f℥ij. to f℥ss. |
| ——— Croci ... ... ... ... | f℥ij. to f℥ss. |
| ——— Ferri iodidi ... ... ... | min. xv. to min. lx. |
| ——— lactatis ... ... ... | f℥ij. to f℥ss. |
| ——— Hemidesmi ... ... ... | f℥j. to f℥ij. |
| ——— Ipecacuanhæ (Emetic) ... ... | f℥j. to f℥ij. |
| ——— (Expectorant) ... | f℥j. to f℥ij. |
| ——— Limonum ... ... ... ... | f℥j. to f℥ij. |
| ——— Mori ... ... ... ... | f℥j. to f℥ij. |
| ——— Papaveris ... ... ... ... | f℥ss. to f℥j. |
| ——— rhœadis ... ... | f℥ss. to f℥j. |
| ——— Potassii cyanidi ... ... ... | f℥ij. to f℥vj. |
| ——— Rhamni ... ... ... | f℥ss. to f℥j. |
| ——— Rhei ... ... ... ... | f℥ss. to f℥j. |
| ——— Rosæ gallicæ ... ... ... | f℥ss. to f℥j. |
| ——— Sarsaparillæ ... ... ... | f℥iv. to f℥vj. |
| ——— Scillæ (Emetic) ... ... ... | f℥j. to f℥ij. |
| ——— (Expectorant) ... ... ... | min. x. to min. xxx. |
| ——— Sennæ ... ... ... ... | f℥ss. to f℥j. |
| ——— Tolutanus ... ... ... ... | f℥ij. to f℥ss. |
| ——— Violæ ... ... ... ... | f℥j. to f℥iv. |
| ——— Zingiberis ... ... ... ... | f℥j. to f℥ss. |
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| Tamarindus ... ... ... ... | ℥ss. to ℥iss. |
| Tanacetum vulgare ... ... ... ... | ℈j. to ℥j. |
| Tannin ... ... ... ... | gr. ss. to gr. ij. |

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| Terebinthina Canadensis ... ... ... | gr. x. to gr. xxx. |
| ——— Chia ... ... ... | gr. x. to gr. xxx. |
| Tinctura Absinthii ... ... ... ... | ʒij. to ʒss. |
| ——— Aconiti ... ... ... | min. v. to min. viij. |
| ——— Aloes ... ... ... ... | min. xxx. to ʒss. |
| ——— composita ... ... ... | ʒss. to ʒij. |
| ——— Ammoniæ composita ... ... ... | min. v. to min. x. |
| ——— Arnicæ ... ... ... ... | ʒss. to ʒij. |
| ——— Assafœtidæ ... ... ... ... | ʒss. to ʒij. |
| ——— Aurantii ... ... ... | ʒj. to ʒiij. |
| ——— Belladonnæ ... ... ... ... | min. ij. to min. iij. |
| ——— Benzoïni ... ... ... | ʒss. to ʒij. |
| ——— Buchu ... ... ... ... | ʒj. to ʒiij. |
| ——— Calumbæ ... ... ... | ʒj. to ʒij. |
| ——— Camphoræ composita ... ... ... | ʒj. to ʒiij. |
| ——— Cannabis ... ... ... | ʒss. to ʒij. |
| ——— Cantharidis ... ... ... ... | min. x. to min. xl. |
| ——— Capsici ... ... ... | min. xx. to ʒj. |
| ——— Cardamomi ... ... ... ... | ʒj. to ʒij. |
| ——— composita ... ... | ʒj. to ʒij. |
| ——— Cascarillæ ... ... ... ... | ʒj. to ʒss. |
| ——— Cassiæ ... ... ... ... | ʒj. to ʒij. |
| ——— Castorei ... ... ... ... | ʒij. to ʒiv. |
| ——— composita ... ... | ʒj. to ʒij. |
| ——— Catechu ... ... ... ... | ʒj. to ʒij. |
| ——— Chirettæ ... ... ... | ʒj. to ʒij. |
| ——— Cinchonæ ... ... ... ... | ʒj. to ʒiij. |
| ——— composita ... ... | ʒj. to ʒss. |
| ——— Cinnamomi ... ... ... ... | ʒj. to ʒss. |
| ——— composita ... ... ... | ʒj. to ʒij. |
| ——— Colchici ... ... ... | ʒj. to ʒij. |
| ——— composita ... ... | min. xx. to min. xxx. |
| ——— Colocynthidis ... ... ... | min. x. to min. xv. |
| ——— Conii ... ... ... ... | min. xx. to min. xl. |
| ——— Croci ... ... ... ... | ʒj. to ʒij. |
| ——— Cubebæ ... ... ... | ʒj. to ʒij. |
| ——— Cuspariæ ... ... ... ... | ʒj. to ʒij. |
| ——— Digitalis (Diuretic) ... ... | min. xx. to min. xxx. |
| ——— (Sedative) ... ... ... | ʒss. to ʒiss. |
| ——— Ergotæ ... ... ... | min. x. to ʒj. |
| ——— etherea ... ... ... | min. x. to ʒj. |
| ——— Ferri acetatis ... ... ... | min. xxx. to ʒj. |
| ——— cum alcohole ... ... | min. xxx. to ʒj. |
| ——— ammonio-chloridi ... ... | min. xij. to min. xl. |
| ——— aurantiacea ... ... ... | ʒj. to ʒiv. |
| ——— muriatis ... ... ... | min. x. to ʒss. |
| ——— Fuliginis ... ... ... ... | ʒj. to ʒij. |
| ——— Galbani ... ... ... | ʒj. to ʒij. |
| ——— Gallarum .. ... ... ... | ʒss. to ʒij. |
| ——— Gambogiæ ... ... ... | ʒss. to ʒj. |
| ——— Gentianæ composita ... ... ... | ʒj. to ʒij. |
| ——— Guaiaci ... ... ... | ʒj. to ʒss. |
| ——— ammoniata ... ... ... | ʒj. to ʒij. |
| ——— Hellebori ... ... ... | ʒj. to ʒij. |

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| ——— Iodinii ... ... ... ... | min. v. to min. xx. |
| ——— composita ... ... ... | min. x. to min. xxx. |
| ——— Jalapæ ... ... ... | f℥j. to f℥iv. |
| ——— Kino ... ... .. ... | f℥j. to f℥ij. |
| ——— Lactucarii ... ... ... | f℥j. to f℥ij. |
| ——— Lobeliæ ... ... ... ... | f℥ss. to f℥j. |
| ——— ætherea ... ... | min. xx. to min. xl. |
| ——— (Whitlaw) ... ... ... | min. v. to min. xx. |
| ——— Lupuli ... ... ... | f℥ss. to f℥ij. |
| ——— Matico ... ... ... ... | f℥j. to f℥ij. |
| ——— Monesiæ ... ... ... | f℥j. to f℥ij. |
| ——— Moschi ... ... ... ... | f℥iij. to f℥vj. |
| ——— Myrrhæ ... ... ... | f℥j. to f℥ij. |
| ——— Nucis vomicæ ... ... ... | min. x. to min. xxx. |
| ——— Opii ... ... ... ... | min. x. to min. xxx. |
| ——— ammoniata ... ... ... | f℥ss. to f℥ij |
| ——— camphorata ... ... ... | f℥j. to f℥iij. |
| ——— Quassiæ ... ... ... ... | f℥j. to f℥ij. |
| ——— composita ... ... | f℥j. to f℥ss. |
| ——— Rhei ... ... ... ... | f℥j. to f℥iij. |
| ——— composita ... ... ... | f℥j. to f℥iij. |
| ——— et Aloës ... ... ... | f℥ss. to f℥j. |
| ——— et Gentianæ ... ... | f℥j. to f℥ij. |
| ——— Scillæ ... ... ... ... | min. x. to min. xxx. |
| ——— Sennæ composita ... ... | f℥ss. to f℥j. |
| ——— Serpentariæ ... ... ... ... | f℥j. to f℥ij. |
| ——— Stramonii ... ... ... | min. x. to min. xxx. |
| ——— Tolutana ... ... ... ... | f℥j. to f℥ij. |
| ——— Toxicodendri ... ... ... | f℥ss. to f℥j. |
| ——— Valerianæ ... ... ... ... | f℥ij. to f℥iv. |
| ——— ammoniata ... ... | f℥j. to f℥ij. |
| ——— Veratriæ ... ... ... ... | min. v. to min. xv. |
| ——— Zingiberis ... ... ... | f℥j. to f℥ij. |
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| ——— Opii ... ... ... ... | No. 10. to 12. *(Daily)* |
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| —— cyanidum ... ... ... ... | gr. $\frac{1}{4}$ to gr. $\frac{1}{2}$. |
| —— oxydum ... ... ... ... | gr. j. to gr. ij. |
| —— sulphas ... ... ... ... | gr. j. to gr. v. |
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